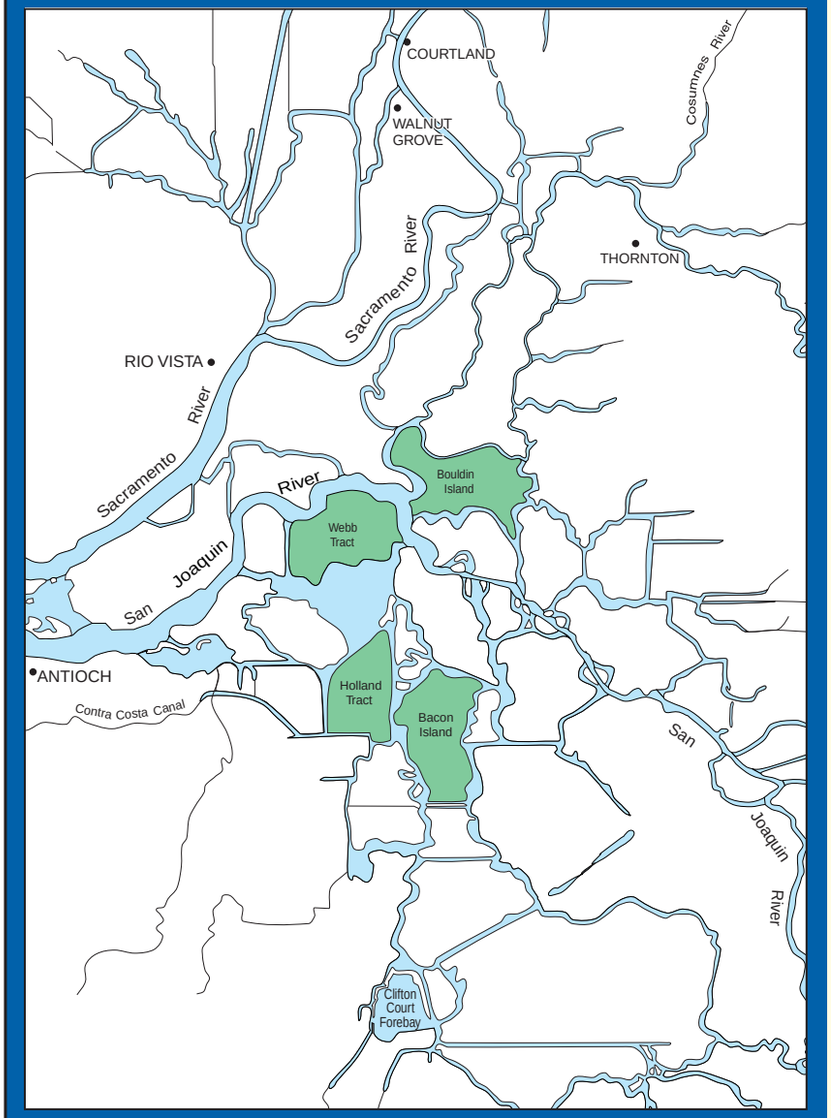
Final
Environmental Impact Statement



July 2001

Delta Wetlands Project

Volume 2

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Sacramento District

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Final
Environmental Impact Statement
for the Delta Wetlands Project

Volume 2

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List of Acronyms

1995 DEIR/EIS	1995 Delta Wetlands Project Draft Environmental Impact Report and Environmental Impact Statement
1995 WQCP	1995 Water Quality Control Plan for the San Francisco Bay/ Sacramento–San Joaquin Delta Estuary
2000 REIR/EIS	2000 Revised Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project
Fg/l	micrograms per liter
FS	microsiemens
FS/cm	microsiemens per centimeter
af	acre-foot
AFRP	Anadromous Fish Restoration Program
CALFED	CALFED Bay-Delta Program
Caltrans	California Department of Transportation
CCMAD	Contra Costa Mosquito Abatement District
CCWD	Contra Costa Water District
CEQA	California Environmental Quality Act
cfs	cubic feet per second
COTP	California-Oregon Transmission Project
CPUC	California Public Utilities Commission
CUWA	California Urban Water Agencies
CVOCO	Central Valley Operations Coordinating Office
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
DBP	disinfection byproduct
DCC	Delta Cross Channel
D/DBP	Disinfection/Disinfection Byproducts
Delta	Sacramento-San Joaquin Delta
DeltaSOQ	Delta Standards, Operations, and Quality model
DeltaSOS	Delta Standards and Operations Simulation model
DFG	California Department of Fish and Game
DO	dissolved oxygen
DOC	dissolved organic carbon
DOT	U.S. Department of Transportation
DRB	design review board
DSOD	Division of Safety of Dams
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
EC	electrical conductivity

E/I	export/inflow
EIR	environmental impact report
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
EWA	Environmental Water Account
FDM	Fischer Delta Model
FEIR	final environmental impact report
FEIS	final environmental impact statement
FMWT	fall midwater trawl
FOC	final operations criteria
fps	feet per second
FS	factor of safety for slope stability
g/m^2	grams per square meter
HEP	habitat evaluation procedures
HLA	Harding Lawson Associates
HMAC	Habitat Management Advisory Committee
HMP	habitat management plan
IEP	Interagency Ecological Program
ISI	Integrated Storage Investigation
km	kilometer
LAFCO	Local Agency Formation Commission
LOS	level of service
MAB	Reservoir Island Monitoring and Action Board
MAF	million acre-feet
MCL	maximum contaminant level
mg/l	milligrams per liter
msl	mean sea level
MWD	Metropolitan Water District of Southern California
MWQI	Municipal Water Quality Investigations
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PG&E	Pacific Gas and Electric Company
ppt	parts per thousand
psi	pounds per square inch
RMA	Resource Management Associates
ROW	right-of-way
RPM	reasonable and prudent measure
RWQCB	regional water quality control board
SB	Senate Bill
SJCMAD	San Joaquin County Mosquito Abatement District
SLC	State Lands Commission
SMARTS	Special Multipurpose Applied Research Technology Station

SR	State Route
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	thousand acre-feet
TAF/yr	thousand acre-feet per year
TDS	total dissolved solids
THM	trihalomethane
THMFP	trihalomethane formation potential
TOC	total organic carbon
TTHM	total trihalomethane
USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UVA	ultraviolet absorbance
VAMP	Vernalis Adaptive Management Plan
WQMP	Delta Wetlands Water Quality Management Plan
WTP	water treatment plant

Chapter 1. Introduction to the Responses to Comments

Chapter 1. Introduction to the Responses to Comments

This volume of the Final Environmental Impact Statement (FEIS) for the Delta Wetlands Project has been prepared under the direction of the U.S. Army Corps of Engineers (USACE) in accordance with the requirements of the National Environmental Policy Act (NEPA).

The environmental impacts of the Delta Wetlands Project were analyzed in the 1995 Delta Wetlands Project Draft Environmental Impact Report and Environmental Impact Statement (1995 DEIR/EIS) and the 2000 Revised Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project (2000 REIR/EIS). This volume of the FEIS has been prepared to provide responses to comments received on those two documents.

As described in Chapter 1 of Volume 1, the 1995 DEIR/EIS was issued by the State Water Resources Control Board (SWRCB) and USACE, the joint lead agencies under the California Environmental Quality Act (CEQA) and NEPA, respectively. The lead agencies circulated the 1995 DEIR/EIS for public review and comment and received numerous comment letters. The SWRCB and USACE directed that some portions of the information and analyses presented in the 1995 DEIR/EIS be revised and recirculated for public review and comment in the 2000 REIR/EIS; the 2000 REIR/EIS included revised information on water supply and operations, water quality, fisheries, levee stability and seepage, and natural gas facilities and transmission pipelines. The lead agencies received several comment letters on the 2000 REIR/EIS.

In responding to comments on a draft EIR/EIS, the lead agencies must respond to:

comments received during the initial circulation period that relate to chapters or portions of the document that were not revised and recirculated, and

comments received during the recirculation period that relate to the chapters or portions of the earlier EIR/EIS that were revised and recirculated.

Some persons and agencies commented on the portions of the 1995 DEIR/EIS that were recirculated, then commented on the 2000 REIR/EIS analyses of the same issues. In some of these instances, detailed responses are provided in this FEIS only to the later comments.

The remainder of Volume 2 of the FEIS is organized as follows:

Chapter 2, “Master Responses: Discussions of Recurring Themes”, presents detailed discussions of several subjects that were raised frequently in comment letters on the 1995 DEIR/EIS and the 2000 REIR/EIS. Each section provides a comprehensive discussion of a subject that was raised in several comments; the discussion serves as a “master response” to those individual comments.

Chapter 3, “Comments and Responses to Comments on the 1995 Draft Environmental Impact Report/Environmental Impact Statement”, contains a list of all agencies and persons who submitted comments on the 1995 DEIR/EIS during the public review period, copies of the comment letters received, and responses to the comments.

Chapter 4, “Responses to Comments on the 2000 Revised Draft Environmental Impact Report/Environmental Impact Statement”, contains a list of all agencies and individuals who submitted comments on the 2000 REIR/EIS during the public review period, copies of the comment letters received, and responses to the comments.

Chapter 5, “Citations”, lists supporting references used in the preparation of the responses to comments.

The Appendix to the Responses to Comments includes information on endangered species consultation issued after the 2000 REIR/EIS was published, and protest dismissal agreements submitted to the SWRCB. These materials are referred to in the responses to comments.

Chapter 2. Master Responses: Discussions of Recurring Themes

Chapter 2. Master Responses: Discussions of Recurring Themes

INTRODUCTION

This chapter discusses several subjects that were mentioned frequently in comment letters on the 1995 DEIR/EIS and the 2000 REIR/EIS. Each of the following sections summarizes the individual comments that refer to a single theme and provides a comprehensive discussion of that theme that serves as a "master response" to those individual comments. These master responses to groups of individual comments are being provided for two purposes:

to simplify the responses to comments by avoiding unnecessary repetition in individual responses, and

to address issues in a broader context than might be required by individual comments.

When issues are addressed in this broader context, the interrelationships between some of the individual issues raised can be better clarified; it is also possible to provide a single explanation of an issue that is more thorough and comprehensive than separate, narrowly focused responses would be.

The following themes are discussed in the master responses:

Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow;

Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program;

Areas of End Use and Potential Growth-Inducement Effects of Delta Wetlands Water Deliveries;

Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions;

Mitigation of Environmental Effects Related to Use of Recreation and Boat Facilities;

Significance Criteria Used for the Water Quality Impact Analysis;

Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts; and

Levee Stability Analysis and Worst-Case Conditions.

MASTER RESPONSE 1. PROJECT OBJECTIVES: ANALYZING EFFECTS OF WATER TRANSFERS, BANKING, AND AUGMENTING OUTFLOW

The purpose of the Delta Wetlands Project, as stated in the 1995 DEIR/EIS and the 2000 REIR/EIS, is "to divert surplus Delta inflows, transferred water, or banked water for later sale and/or release for Delta export or to meet water quality or flow requirements for the Bay-Delta estuary". Several commenters note that these documents did not analyze the environmental effects associated with using the reservoir islands for transferring and banking water or using the Delta Wetlands water for environmental purposes (i.e., to augment Delta outflow).

Transfers and Banking

Delta Wetlands has applied to the SWRCB for the right to divert water in excess of the rights of senior water right holders and of fish and wildlife requirements; the aim of Delta Wetlands is to sell the water to purveyors or users in the Central Valley Project (CVP) and State Water Project (SWP) service areas or the Bay-Delta estuary (see Appendix 2 of the 1995 DEIR/EIS).

SWRCB approval of Delta Wetlands' water rights applications does not constitute approval of transfers or banking of other water right holders' water. However, if Delta Wetlands' permit applications are approved and the project is built, other water right holders could use the reservoir islands to store water temporarily under agreement with Delta Wetlands, as long as the water right holders obtain the appropriate authorizations from the SWRCB. Any parties wishing to temporarily store or bank water on the Delta Wetlands Project islands would be required to apply to the SWRCB for points of rediversion on the Delta Wetlands Project islands for their specific water rights. Before granting this authorization, the SWRCB would determine whether the new points of rediversion could cause significant environmental impacts. To make such a determination, the SWRCB may need to complete additional environmental documentation addressing the impacts of the transfers and banking on fisheries, hydrodynamics, and water quality.

Although the 1995 DEIR/EIS and 2000 REIR/EIS indicate that the reservoir islands may be used for transfers or banking in the future, such uses are too speculative to be analyzed at this time. Sections 15144 and 15145 of the State CEQA Guidelines state that an agency must use its best efforts to predict impacts but is not required to predict the unforeseeable. If the agency finds, after a thorough investigation, that an impact is too speculative to evaluate, it should note this conclusion and proceed. Additionally, Section 15146 states that the specificity of an EIR should correspond to the specificity of the underlying activity being evaluated. Therefore, the NEPA and CEQA analysis of the project has been limited to addressing the effects of project operations using water that would

be diverted, stored, and discharged under Delta Wetlands' own appropriative permits. See also the discussion of project integration under Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

Use of Delta Wetlands Discharges to Provide Water for Outflow

Although one of the proposed uses of water stored on the Delta Wetlands reservoir islands is "to meet water quality or flow requirements for the Bay-Delta estuary", the 1995 DEIR/EIS and 2000 REIR/EIS did not quantitatively analyze the potential use of Delta Wetlands Project water to provide environmental benefits. The purpose of the environmental impact analysis is to identify significant environmental impacts associated with implementing the proposed project. Therefore, the modeling of Delta Wetlands Project operations used a "worst-case" scenario under which all water discharged by the Delta Wetlands Project was simulated as being exported through the SWP and CVP pumps. This assumption was used to allow for simulation of the greatest detrimental effects on water supply, water quality, and fishery resources.

It is not known at this time in what specific ways Delta Wetlands Project operations could contribute to outflow for environmental purposes. However, it is reasonable to assume that releasing Delta Wetlands Project water to augment outflow would *benefit* fisheries and water quality; therefore, no quantitative impact analysis of Delta Wetlands releases of water for outflow augmentation is required.

Chapter 3F of the 1995 DEIR/EIS in Volume 1 of this FEIS also suggests that if the Delta Wetlands Project is integrated into CVP and SWP operations, water may be discharged from the Delta Wetlands reservoir islands to substitute for releases from Shasta, Oroville, and Folsom Dams to help meet Bay-Delta outflow requirements, resulting in changes in riverine conditions. However, no proposals for which the lead agencies could reasonably assess the environmental effects have been made to coordinate Delta Wetlands Project operations with, or integrate them into, upstream water facility operations.

Although Delta Wetlands Project operations could be integrated with operation of SWP and CVP or other facilities to benefit the environment in addition to water supply, the NEPA and CEQA analysis does not speculate on the variety of ways that the project could be incorporated into other water operations. The environmental effects of such potential future integrated operations of the project would need to be addressed in additional environmental documentation when specific proposals for integration are made that would require additional permits and authorizations. See the discussion of project integration under Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

MASTER RESPONSE 2. INTEGRATION OF THE DELTA WETLANDS PROJECT WITH FEDERAL AND STATE WATER PROJECT OPERATIONS, INCLUDING THE CALFED BAY-DELTA PROGRAM

Several commenters on the 1995 DEIR/EIS commented on the potential for integrating Delta Wetlands Project operations with other water facility operations, such as transfers and banking or substitution of Delta Wetlands discharges for upstream releases to augment outflow. They noted that for such an integration to occur, Delta Wetlands operations would have to be coordinated or integrated with SWP and CVP operations. Commenters also requested information about the possible relationship of Delta Wetlands Project operations to the CALFED Bay-Delta Program (CALFED).

For purposes of the NEPA and CEQA (and biological assessment) analysis, the Delta Wetlands Project is analyzed as a stand-alone water storage facility, operated independently of the SWP and the CVP and without regard to the specific entities to which the water could be sold. It is reasonable to assume that Delta Wetlands Project operations could be integrated in the future with operation of the SWP and CVP or other facilities to benefit the environment in addition to water supply. Several potential opportunities exist to operate the Delta Wetlands Project in conjunction with the CVP and SWP or in coordination with CALFED; however, no specific proposals have been made for which the lead agencies could reasonably assess the environmental effects. Therefore, discussion of such arrangements would be speculative. Additional environmental documentation would be needed to address the environmental effects of potential future integrated operations of the project when specific proposals for integration are made that would require additional permits and authorizations.

As described in Chapter 2 of the 2000 REIR/EIS and in Volume 1, Chapter 2 of this FEIS, CALFED has identified providing new storage of surface water and groundwater as a possible action to be included in its program; it has also identified the possibility of using in-Delta storage for diversions and to manage Delta flows. CALFED's Phase II report, published in 1998, identified storing 230 thousand acre-feet (TAF) of water on Delta islands as one of 14 ways to provide water supply, flood control, water quality, and ecosystem benefits. The Delta Wetlands Project could be included as part of the CALFED in-Delta storage element.

CALFED has undertaken an Integrated Storage Investigation (ISI) to evaluate various types of water storage projects and the possible role of in-Delta, onstream, and offstream water storage projects in overall water management. The Delta Wetlands Project may be one option for in-Delta storage and is a candidate for consideration by the ISI. CALFED may use some of the information presented in the 1995 DEIR/EIS and the 2000 REIR/EIS to determine whether it could include the Delta Wetlands Project in its in-Delta storage element; however, assumed project operations under this CALFED element would differ from the independent operations analyzed in these documents, and CALFED would need to analyze the project separately.

In May 2000, the U.S. Bureau of Reclamation (USBR) prepared and distributed an appraisal report that offers a preliminary assessment of the Delta Wetlands Project's feasibility in terms of

water supply capability, operational flexibility, project cost, and issues critical to implementation. The report recommends that USBR management seek authority and funding to begin investigating the project's feasibility and notes that the project's cost compares favorably with the cost of other surface storage options being investigated by CALFED.

Additional environmental review and permitting decisions would be required before the Delta Wetlands Project could be incorporated into CALFED and/or SWP and CVP operations or before the California Department of Water Resources (DWR), USBR, or CALFED could implement the project. These uses of the Delta Wetlands Project are too speculative to be addressed at this time; therefore, they were not included in the NEPA and CEQA analysis.

MASTER RESPONSE 3. AREAS OF END USE AND POTENTIAL GROWTH-INDUCEMENT EFFECTS OF DELTA WETLANDS WATER DELIVERIES

Several commenters on the 1995 DEIR/EIS and the 2000 REIR/EIS requested additional analysis of the potential environmental impacts associated with use of water discharged by Delta Wetlands for export. Although the 1995 DEIR/EIS states that exporting Delta Wetlands Project water could induce growth, the document does not identify buyers of the water or specify the locations within the CVP and SWP service areas where the water would be put to beneficial use. The 1995 DEIR/EIS states that the identity of the end user of the Delta Wetlands water remains speculative because of the diverse interests and competing demands for water for municipal, agricultural, and environmental needs. This issue was identified as an area of known controversy in the 1995 DEIR/EIS and the 2000 REIR/EIS.

Commenters requested that the NEPA and CEQA analysis describe the impacts associated with the end use of the Delta Wetlands water delivered in the SWP/CVP service area. Some commenters on the 1995 DEIR/EIS also suggested that the lead agencies adopt mitigation, such as the preparation of regional multispecies conservation plans, to offset the effects of growth on fish and wildlife in the SWP/CVP service area. Another commenter was concerned that delivering additional water to the west side of the San Joaquin Valley would compound water quality problems in the San Joaquin River associated with agricultural return flows.

The purpose of this master response is to comprehensively address issues associated with use of water exported from the Delta Wetlands Project and to provide additional information to the reviewers about CEQA and NEPA requirements for analysis of indirect and growth-inducing effects.

CEQA and NEPA Requirements for Analysis of Indirect and Growth-Inducing Effects

CEQA and NEPA require that an EIR/EIS address the secondary effects that could result from growth indirectly induced by a project. According to the State CEQA Guidelines

(Section 15126[g]), an EIR must discuss how a project could directly or indirectly lead to economic, population, or housing growth. A project can be considered growth inducing if it removes obstacles to growth, increases the demands on community service facilities, or encourages other activities that cause significant environmental effects.

Additionally, NEPA requires that an EIS address the indirect effects of an action or project, which may include growth-inducing effects and other effects related to induced changes in the pattern of land use; population density or growth rate; and related effects on air, water, and other natural systems or ecosystems (40 CFR 1508[b]). An EIS must identify the effects that are known and make a good-faith effort to explain these effects; however, if there is uncertainty about these effects, an agency is not required to engage in speculation but should make a judgment based on reasonably foreseeable occurrences.

Sections 15144 and 15145 of the State CEQA Guidelines state that an agency must use its best efforts to predict impacts but is not required to predict the unforeseeable. If the agency finds, after a thorough investigation, that an impact is too speculative to evaluate, it should note this conclusion and proceed. Section 15146 states that the specificity of an EIR should correspond to the specificity of the underlying activity being evaluated.

The lead agencies prepared the 1995 DEIR/EIS and the 2000 REIR/EIS based on the assumption that there is currently unmet demand for water in the SWP/CVP service area and that such demand will exist in the future. For purposes of impact assessment, it was therefore assumed that water stored on Delta Wetlands' reservoir islands would be exported using the SWP and CVP facilities. However, the lead agencies consider the areas of delivery and end use of Delta Wetlands Project water to be too unforeseeable and speculative for site-specific analysis. The following section describes the variety of potential uses of Delta Wetlands Project water based on current and anticipated unmet demands, and the resulting uncertainty in predicting the amounts of project water that could be delivered to the SWP/CVP service area and the areas in which they would be used.

The subsequent section describes a general approach for determining potential growth-inducing impacts of the project based on two worst-case assumptions: first, that all project water would be delivered as exports to the SWP/CVP service area; and second, that such water would constitute a new source of water that could induce growth.

Demand for Water and Potential End Uses

According to DWR (California Department of Water Resources 1998), California water supplies (with existing facilities and programs) are expected to annually average 78.1 million acre-feet (MAF) in 2020. Average water demand in the state is projected to total 81 MAF by 2020. These supply-and-demand conditions indicate that water shortages are expected to occur during both average water years and drought years. Areas of California that rely on the Delta for all or a portion of their supplies are expected to experience not only shortages but reliability problems (California

Department of Water Resources 1998). Shortages could be especially acute in the South Coast region, including Los Angeles, Orange, and San Diego Counties.

As documented in the 2000 REIR/EIS, Delta Wetlands Project operations were analyzed using a 1995 level of demand for water. The analysis showed that south-of-Delta delivery deficits (demands not met by SWP and CVP deliveries) exist in most years under this assumed level of demand. However, demand for water has already increased above this level, and future demands can be expected to be greater as well. For example, in the last year, the Central Valley Project Improvement Act (CVPIA) b(2) rules have been interpreted much more strictly than before; as a result, projected effects on CVP agricultural contractors (i.e., delivery deficits) are greater than they were a few years ago. In addition, the CVP must obtain and wheel "Level 4" water supplies of about 200 TAF to wildlife refuges. Also, the CALFED Environmental Water Account (EWA) represents a new, potential purchaser of stored water. The Metropolitan Water District of Southern California (MWD) has begun filling the Eastside Reservoir, which represents an addition to overall demand not accounted for in DWR's operations planning model DWRSIM. These changes all reflect greater demand for water than the demand assumed for the 2000 REIR/EIS simulations of Delta Wetlands Project operations.

The environmental effects of using Delta Wetlands project water to meet these different needs could vary significantly. Based on simulated delivery deficits reported in Chapter 3 of the 2000 REIR/EIS and Chapter 3A of FEIS Volume 1, there are substantial existing shortages in SWP and CVP contract deliveries, and the programs described above are likely to result in less reliability of CVP contracted water in the future. New sources of water, such as the Delta Wetlands Project, may replace these diminishing supplies for contractors and may help improve reliability. Although this use of Delta Wetlands Project water may not support new development per se, it could increase the frequency of environmental impacts associated with existing water use in the contract areas; water quality impacts in the San Joaquin River watershed are one example of an existing problem in a CVP contract area. On the other hand, use of Delta Wetlands Project water for environmental purposes (e.g., the CALFED EWA) may benefit fisheries, water quality, and other resources.

The specific beneficial uses of water from Delta Wetlands are still too varied and speculative for an analysis of site-specific impacts to be performed. Nevertheless, the lead agencies recognize that delivery of Delta Wetlands Project water could result in growth-inducing impacts, as described below.

Growth Inducement

The proposed project could be growth inducing for two reasons:

It would add water directly for export to municipal water supplies or agricultural production that may support growth.

Delta Wetlands Project water could be used to meet water quality or environmental requirements as a substitute for other water that could be used to support growth.

Water stored on the Delta Wetlands reservoir islands could be discharged into Delta channels and then exported through SWP or CVP facilities for sale to participating water purveyors. It is estimated that the annual average of the mean monthly Delta Wetlands discharges would range from approximately 114 TAF under the proposed project to 302 TAF under Alternative 3.

The future purchasers and users of Delta Wetlands Project water are not known; however, project water could be exported to any of the following:

municipal water agencies that provide water to residential, commercial, and industrial customers;

irrigation districts that provide water to farms; or

areas where the water is needed to meet water quality or environmental requirements.

The increase in water supplies and in reliability of supplies provided by the Delta Wetlands Project could encourage and accommodate additional population growth and housing development, commercial and industrial development, and expansion of areas under agricultural cultivation in the SWP/CVP service area south of the Delta.

State Water Project and Central Valley Project Service Areas

The SWP service area consists of 29 contractors in six local service areas; there are 24 contractors in four service areas south of the Delta (the South Bay, San Joaquin Valley, Central Coastal, and Southern California service areas). These four local service areas supply water to portions of 14 counties (Alameda, Santa Clara, Stanislaus, Kings, Kern, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, San Bernardino, Riverside, Imperial, and San Diego).

Each SWP contractor has its own political boundaries, and SWP supplies may be used in only a portion of a contractor's service area. Many contractors (such as MWD and the Kern County Water Agency) act as wholesalers of SWP supplies and sell water to other agencies. (California Department of Water Resources 1995.)

The CVP provides water to 250 long-term contractors in portions of 29 counties statewide, including areas of counties that are south of the Delta, such as Contra Costa, Santa Clara, Santa Cruz, San Benito, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and Kern Counties.

About 90% of CVP water has gone to agricultural uses in the recent past; however, increasing quantities of water are currently being provided to municipal customers, including urban areas such as Tracy, northeastern Contra Costa County, and Fresno.

Potential Growth Accommodated by Delivery of Delta Wetlands Project Water

Water stored on the Delta Wetlands islands and exported from the Delta could partially offset projected water shortages in areas south of the Delta, allowing growth and increased crop cultivation in areas otherwise constrained by future water shortages. The amount of growth that could be accommodated by Delta Wetlands Project discharges is impossible to estimate.

One method of evaluating the quantitative relationship between population growth and water supplies is the "population-supported" method (California Department of Water Resources 1995). This method uses per capita water-use estimates to determine the amount of growth supported by a given volume of water, based on the assumption that a specific water volume can physically support a certain number of people per year. This approach oversimplifies the relationship between water supplies and growth because it does not take into account the ability of people to adjust to changes in water supplies; however, it provides a simple tool for evaluating project effects.

Per capita water use in regions that could receive Delta Wetlands Project water is projected to average approximately 230 gallons daily for all urban uses in 2020 (California Department of Water Resources 1998). Based on this per capita usage and using the very conservative assumption that all Delta Wetlands Project water is used for urban purposes, it is estimated that the average of 114–302 TAF of water annually provided under the project alternatives could support population growth ranging from 442,000 to 1,172,000 persons. This estimate is probably substantially greater than the growth that could actually occur as a result of Delta Wetlands Project implementation because Delta Wetlands Project water would likely be used to offset water delivery shortages in existing developed areas and also may be used for agricultural and environmental purposes. This worst-case estimate, however, indicates that growth supported by Delta Wetlands Project implementation could be substantial, even when spread over a large area and over many years.

An unreasonable amount of speculation would be required to determine where the Delta Wetlands Project could induce growth. As discussed above, water could be purchased and distributed in portions of counties served by the SWP and CVP south of the Delta. Furthermore, numerous factors would dictate where future growth supported by Delta Wetlands water would occur within those areas. These factors include:

- local government growth policies and plans,
- local and regional fiscal and economic conditions,
- employment growth locations,
- housing affordability and availability,
- quality of life considerations,
- climate, and
- the availability of supporting infrastructure.

Based on future growth projections, it can be assumed that much of any growth supported by Delta Wetlands Project discharges would probably occur in the South Coast region, primarily

within the Los Angeles metropolitan area. DWR (California Department of Water Resources 1998) projects that the population of the South Coast region will increase by more than 6 million people by 2020.

Potential Environmental Effects of Growth

The secondary impacts that could result from urban growth and increased crop cultivation in the CVP and SWP service areas vary depending on site-specific conditions. In general, housing growth and commercial and industrial development could result in the following types of environmental impacts:

loss of vegetation and wildlife habitat and related effects on plant communities and wildlife, including threatened and endangered species;

decreased air quality caused by automobile emissions and industrial pollutants;

reduced water quality caused by increased urban runoff and industrial discharges;

destruction of cultural and historical resources located at development sites;

conversion of prime and productive agricultural lands to nonagricultural uses, and related losses of agricultural employment;

increased demand for government services, including educational services and police and fire protection services; and

increased need for public infrastructure, including wastewater treatment facilities, parks, and roadways.

Additionally, if new water sources are used to bring existing fallow or natural lands into production, irrigating and cultivating more farmland could result in similar types of impacts, including:

the loss of natural vegetation and wildlife habitat and related effects on plant communities and wildlife, including threatened and endangered species;

decreased air quality resulting from generation of dust and applications of pesticides; and

reduced water quality caused by agricultural runoff to streams and rivers, and related impacts on fish species and habitat.

The environmental documentation prepared by local, state, and federal agencies that approve and provide permits for residential, commercial, and industrial projects would identify the site- and issue-specific growth-inducement impacts resulting from the provision of Delta Wetlands Project

water. Public involvement and agency consultation would occur during the environmental documentation process for site-specific projects.

As part of the environmental process required by CEQA and NEPA, the significant impacts of projects would be identified and mitigation of impacts would be adopted and implemented if available and feasible. The responsibility for implementing and monitoring mitigation measures would lie with local, state, or federal agencies with discretionary authority over projects. Some projects may result in impacts that cannot be mitigated or reduced to less-than-significant levels; in such cases, growth inducement associated with implementation of the Delta Wetlands Project could result in residual impacts.

Conclusion

In summary, the additional water supply that could be provided by the Delta Wetlands Project may induce growth in areas south of the Delta, resulting in secondary environmental impacts. More farmland could also be brought into production if water supplies expanded or became more reliable as a result of Delta Wetlands Project implementation. As stated previously, the environmental documentation prepared by local, state, and federal agencies that approve and provide permits for residential, commercial, and industrial projects in the SWP and CVP service areas would identify site- and resource-specific growth inducement impacts resulting from the provision of Delta Wetlands Project water. Mitigation measures implemented by agencies with jurisdiction over urban development projects would address many of the secondary impacts associated with the growth induced by the Delta Wetlands Project.

An unreasonable amount of speculation would be required to determine where the Delta Wetlands Project could induce growth and what the site- and resource-specific unmitigable impacts of growth would be. Although the Delta Wetlands Project could contribute to impacts related to growth inducement, Delta Wetlands cannot be required to provide the framework for statewide mitigation or to prepare regional mitigation plans for undetermined impacts.

MASTER RESPONSE 4. IMPACTS ON FISHERIES IDENTIFIED IN THE 1995 DEIR/EIS AND ADOPTION OF BIOLOGICAL OPINIONS

Numerous comments on the 1995 DEIR/EIS focused on that document's analysis of potential effects of the Delta Wetlands Project on fish species. Following the end of the comment period on the 1995 DEIR/EIS, the SWRCB and USACE concluded formal consultation with the California Department of Fish and Game (DFG), U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS) on potential adverse effects of the project on fish species listed or proposed for listing under the California and federal Endangered Species Acts (ESAs).

The following two sections summarize the results of formal consultation and describe how the terms of the biological opinions reduce potential project effects on fish species and habitat to a less-than-significant level.

Biological Opinions Issued Pursuant to the Federal and California Endangered Species Acts

Biological Opinions for Project Effects on Delta Smelt and Winter-Run Chinook Salmon

In 1997 and 1998, the following no-jeopardy biological opinions were issued that addressed effects of the Delta Wetlands Project, as modified by the project operating parameters referred to as the Delta Wetlands final operations criteria (FOC), on delta smelt and winter-run chinook salmon:

USFWS opinion (May 1997). USFWS addressed project effects on delta smelt and critical habitat for delta smelt; this biological opinion also incorporated a conference opinion on project effects on splittail, which had been proposed for listing as threatened.

NMFS opinion (May 1997). NMFS addressed project effects on winter-run chinook salmon and its critical habitat; this biological opinion also incorporated a draft conference opinion on project effects on the Central Valley steelhead evolutionarily significant unit (ESU), which had been proposed for listing as endangered.

DFG opinion (August 1998). DFG addressed project effects on state-listed species, including delta smelt and winter-run chinook salmon.

These biological opinions are contained in Appendices C, D, and E of the 2000 REIR/EIS.

Consultation on Species Listed Since Issuance of the Biological Opinions for Project Effects on Delta Smelt and Winter-Run Chinook Salmon

Since USFWS, NMFS, and DFG issued the biological opinions for project effects on delta smelt and winter-run chinook salmon, USFWS and NMFS have also listed splittail, Central Valley steelhead ESU, and spring-run chinook salmon as threatened under the federal ESA. Spring-run chinook salmon has also been listed as threatened under the California ESA. In addition, the Delta has been designated critical habitat for steelhead and spring-run chinook salmon under the federal ESA.

Splittail and Steelhead. Because splittail and steelhead had been proposed for listing at the time that the biological assessment for fish species was prepared for the Delta Wetlands Project, the biological assessment analyzed project effects on these species. Consequently, the 1995 DEIR/EIS, which included the biological assessment, fully addressed potential effects of the Delta Wetlands Project on splittail and steelhead.

As noted above, the USFWS and NMFS biological opinions incorporated conference opinions on splittail and steelhead, respectively. The conference opinions found that the Delta Wetlands Project, as modified by the FOC, would not jeopardize the continued existence of these species. USFWS formally adopted the conference opinion as its biological opinion on splittail for the Delta Wetlands Project in April 2000. USFWS's letter notifying USACE of the adoption was included in Appendix E of the 2000 REIR/EIS. NMFS formally adopted the conference opinion as its biological opinion on steelhead for the project in May 2000. NMFS's letter notifying USACE of the adoption is included in the appendix to this volume.

Spring-Run Chinook Salmon. In 1999, to address potential project effects on Central Valley spring-run chinook salmon ESU, USACE requested consultation with NMFS in accordance with Section 7 of the federal ESA. USACE noted that the protective measures included in the biological opinions for previously listed species cover the period when spring-run chinook salmon occur in the Delta and concluded that these measures therefore would also minimize adverse effects of the project on spring-run chinook salmon.

NMFS concurred with this conclusion; in August 2000, NMFS issued a biological opinion that states that the project is not likely to jeopardize the continued existence of spring-run chinook salmon or result in the adverse modification of its critical habitat or that of Central Valley steelhead ESU. NMFS's biological opinion on spring-run chinook salmon is included in the appendix to this volume.

DFG's biological opinion on project effects on delta smelt and winter-run chinook salmon also assessed Delta Wetlands' impacts on spring-run chinook salmon, but made no conclusions about effects on this species because the species was not listed at the time. The reasonable and prudent measures (RPMs) described in the biological opinion were indicated as minimizing adverse impacts of the incidental taking of spring-run chinook salmon and of the fish species that were then listed. In accordance with Section 2081 of the California Fish and Game Code, Delta Wetlands has requested concurrence directly from DFG that the protective measures in the existing biological opinion adequately address potential project effects on spring-run chinook salmon.

Final Operations Criteria and Reasonable and Prudent Measures

DFG, USFWS, and NMFS issued their findings of no jeopardy for delta smelt and winter-run chinook salmon and their habitats, and USFWS and NMFS issued their subsequent biological opinions for splittail, steelhead, and spring-run chinook salmon, on the assumption that Delta Wetlands would incorporate the terms collectively referred to as the FOC into the proposed project. As described in Chapter 2 of Volume 1 of this FEIS, the FOC terms were developed as a part of the consultation process and consist of detailed criteria that govern Delta Wetlands Project operations. The FOC terms primarily specify the allowable timing and magnitude of project diversions for storage and discharges for export or outflow. The biological opinions require Delta Wetlands to operate according to the FOC terms; they also describe reasonable and prudent measures (RPMs) that Delta Wetlands must implement to minimize the adverse impacts of incidental take of listed species. The full FOC text is included in Appendix B of the 2000 REIR/EIS.

The terms included in the FOC and RPMs are more restrictive than the project operating parameters analyzed in the 1995 DEIR/EIS. As described in the 2000 REIR/EIS, incorporating the FOC and RPMs into the proposed project reduces to a less-than-significant level the impacts on fish habitat and populations that were identified as significant in the 1995 DEIR/EIS analysis. The FOC and RPMs also provide adequate protection to prevent significant impacts on nonlisted fish species (e.g., striped bass and American shad).

Summary of Impacts Identified in the 1995 DEIR/EIS and Biological Opinion Measures that Reduce Those Impacts

The following sections summarize the FOC terms and RPMs that relate to the project effects identified in the 1995 DEIR/EIS.

Alteration of Habitat

The 1995 DEIR/EIS identified alteration of habitat under the proposed project as Impact F-1. As described in the 1995 DEIR/EIS, construction of intake facilities and fish screens, discharge facilities, and boat docks could adversely change spawning and rearing habitat used by Delta fish species. This impact was considered significant, and mitigation was proposed to reduce it to a less-than-significant level.

Alteration of habitat under cumulative conditions was identified as Impact F-17 in the 1995 DEIR/EIS and was considered less than significant. Incorporating the following FOC terms into the proposed project reduces this direct and cumulative impact to a less-than-significant level by ensuring that Delta Wetlands would avoid or minimize effects on habitat and would replace lost habitat:

- Conserve in perpetuity 200 acres of shallow-water rearing and spawning habitat.
- Contribute $100 per year for each boat berth constructed beyond preproject conditions to mitigate erosion of habitat from boat wakes.
- Mitigate on a 3:1 basis for the loss of aquatic habitat to construction activities.
- Limit in-water construction to June through November.

Including the following RPMs from the DFG, NMFS, and USFWS biological opinions in the proposed project further reduces project impacts on habitat:

- Provide employee orientation on protection of sensitive species (DFG).
- Report and confirm compliance with DFG construction guidelines (DFG).

Allow DFG personnel access to the project site (DFG).

Establish an aquatic habitat restoration fund (DFG).

Conduct project construction, operation, and maintenance in a manner that does not degrade Delta habitat (NMFS).

Avoid areas of immersed plants where riprap is being placed and where recreation, diversion, and discharge structures are built (USFWS).

Avoid areas of submersed plants where riprap is being placed and where recreation, diversion, and discharge structures are built; limit in-water work to June through November (USFWS).

Increase in Temperature-Related Mortality of Juvenile Chinook Salmon

The 1995 DEIR/EIS identified an increase in temperature-related mortality of juvenile chinook salmon under the proposed project as Impact F-2; this impact was considered significant, and mitigation was proposed to reduce it to a less-than-significant level. Incorporating the following FOC term into the proposed project reduces the potential temperature-related effects of the project on juvenile chinook salmon to a less-than-significant level:

Minimize and avoid adverse effects of discharge through changes in water temperature:

  – When the temperature differential between the discharge and receiving water is greater than 20EF, Delta Wetlands will not discharge.

  – When channel water temperature is 55EF or higher and is less than 66EF, Delta Wetlands discharges will not increase the temperature by more than 4EF.

  – When channel water temperature is 66EF or higher and is less than 77EF, Delta Wetlands discharges will not increase the temperature by more than 2EF.

  – When channel water temperature is 77EF or higher, Delta Wetlands discharges will not increase the temperature by more than 1EF.

  – Delta Wetlands will develop and implement water temperature monitoring.

Potential Increase in Accidental Spills of Fuel and Other Materials

The 1995 DEIR/EIS identified the potential increase in accidental spills of fuel and other materials related to recreational boat use under the proposed project as Impact F-3 and as Impact F-18 for cumulative conditions. Both the direct and cumulative impact were considered less

than significant. Incorporating the following FOC terms into the proposed project further minimizes this potential effect of project implementation:

Conserve in perpetuity 200 acres of shallow-water rearing and spawning habitat.

Contribute $100 per year for each additional boat berth constructed beyond preproject conditions to mitigate erosion of habitat from boat wakes.

Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows, Downstream Transport, Area of Optimal Salinity Habitat, and Entrainment

The 1995 DEIR/EIS addressed the effects of the Delta Wetlands Project on fish habitat, transport, and entrainment, including:

effects of project diversions on outflow and salinity and, therefore, on habitat availability;

effects of project diversions and discharges on Delta channel flow patterns, which affect transport of fish to suitable habitat and to pumping facilities where they may be vulnerable to entrainment; and

effects of project diversions and discharges on percentage of Delta inflow diverted, which is associated with fish entrainment at the CVP and SWP export pumping facilities.

The 1995 DEIR/EIS identified the following significant impacts related to indirect effects of the proposed project on flows, downstream transport of species, and entrainment. Mitigation was proposed to reduce the impacts to a less-than-significant level.

Impact F-4 (proposed project) and Impact F-19 (cumulative conditions): Potential Increase in the Mortality of Chinook Salmon Resulting from the Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows

Impact F-5 (proposed project) and Impact F-20 (cumulative conditions): Reduction in Downstream Transport and Increase in Entrainment Loss of Striped Bass Eggs and Larvae, Delta Smelt Larvae, and Longfin Smelt Larvae

Impact F-7 (proposed project) and Impact F-22 (cumulative conditions): Increase in Entrainment Loss of Juvenile Striped Bass and Delta Smelt

The following impacts were identified in the 1995 DEIR/EIS as less than significant:

Impact F-6 (proposed project) and Impact F-21 (cumulative conditions): Change in Area of Optimal Salinity Habitat

Impact F-8 (proposed project) and Impact F-23 (cumulative conditions): Increase in Entrainment Loss of Juvenile American Shad and Other Species

These potential impacts are addressed by the interrelated FOC terms and RPMs summarized below. Including these measures in the proposed project reduces Impacts F-4 through F-8 to a less-than-significant level.

Total export criteria:

– Annual export of Delta Wetlands stored water will not exceed 250,000 acre-feet (af). This FOC term limits the maximum operation effect that could occur in any given year, and therefore applies to Impacts F-4 through F-8.

Diversion criteria:

– The maximum X2 value limits the start of Delta Wetlands diversions in September through November. This FOC term applies to Impacts F-4, F-6, F-7, and F-8.

– The maximum X2 value limits the magnitude of Delta Wetlands diversions in September through March. This FOC term applies to Impacts F-4 through F-8.

– Delta Wetlands diversions are limited by a maximum allowable change in X2 in October through March. This FOC term applies to Impacts F-4 through F-8.

– Delta Wetlands diversions to storage are limited by QWEST in March. This DFG RPM applies to Impacts F-4, F-5, F-6, and F-7.

– Delta Wetlands will not divert water in April and May. This FOC term applies to Impacts F-4, F-5, F-6, and F-8.

– If the delta smelt fall midwater trawl (FMWT) index is less than 239, Delta Wetlands will not divert water from February 15 through June. This FOC term applies to Impacts F-4, F-5, F-6, and F-8.

– Diversions are limited to a percentage of Delta surplus year round. This FOC term applies to Impacts F-4 through F-8.

– Diversions are limited to a percentage of Delta outflow year round. This FOC term applies to Impacts F-4 through F-8.

– Diversions are limited to a percentage of San Joaquin River inflow in December through March. This FOC term applies to Impacts F-4 through F-8.

- Diversions are reduced when monitoring detects the presence of delta smelt in December through August. This FOC term applies to Impacts F-4 through F-8.

- Diversions are limited if the Delta Cross Channel (DCC) is closed for fish protection in November through January. This FOC term applies to Impacts F-4, F-6, F-7, and F-8.

Discharge criteria:

- Discharges for export from Bacon Island are limited to 50% of San Joaquin River inflow in April through June. This FOC term applies to Impacts F-4, F-5, and F-8.

- Discharges for export from Webb Tract are prohibited in January through June. This FOC term applies to Impacts F-4, F-5, F-7, and F-8.

- Discharges for export or rediversion from the habitat islands (Bouldin Island and Holland Tract) are prohibited all year. This FOC term applies to Impacts F-4, F-5, F-7, and F-8.

- Discharges are limited to a percentage of available unused export capacity in February through July. This FOC term applies to Impacts F-4, F-5, F-7, and F-8.

- Environmental water will be set aside and provided as a percentage of discharge in February through June. This FOC term applies to Impacts F-5, F-6, and F-8.

- Discharges will be reduced when monitoring detects the presence of delta smelt in April through August. This FOC term applies to Impacts F-4, F-5, and F-8.

Other criteria:

- Delta Wetlands will meet a design criterion for fish screens for an approach velocity of 0.2 foot per second (fps). This FOC term applies to Impacts F-7 and F-8.

- Delta Wetlands will conserve in perpetuity 200 acres of shallow-water rearing and spawning habitat. This FOC term applies to Impact F-6.

- To compensate for incidental entrainment losses of listed fish species, Delta Wetlands will provide funds based on the amount of water diverted to storage in January through March and June through August (no diversions are permitted in April and May). This FOC term applies to Impacts F-7 and F-8.

– Delta Wetlands will implement a fish monitoring program that includes:

  - in-channel monitoring during diversions from December through August,
  - on-island monitoring during diversions,
  - monitoring during discharge for export from April through August,
  - reporting,
  - sample handling protocol,
  - coordination with Interagency Ecological Program (IEP) monitoring, and
  - a monitoring technical advisory committee.

  This program, required by the FOC, applies to Impacts F-4 through F-8.

– Delta Wetlands will provide an environmental water fund based on the amount of water diverted from October through March and the amount discharged by the project (DFG biological opinion). This DFG RPM applies to Impacts F-4 through F-8.

– Delta Wetlands will implement aquatic habitat development measures to offset the impacts of moving X2 upstream from February through June (DFG biological opinion). This DFG RPM applies to Impact F-6.

Project Effects on Dissolved Oxygen Levels

The 1995 DEIR/EIS analysis assumed that proposed project operations would not result in significant changes in dissolved oxygen (DO) levels (see "Effects on Water Quality" on pages 3F-16 and 3F-17 in Chapter 3F of the 1995 DEIR/EIS [page 3F-17 in Chapter 3F of FEIS Volume 1). The water in the Delta Wetlands reservoirs would be relatively shallow (generally less than 20 feet deep) and well mixed. It was assumed that DO levels in the reservoirs would be similar to those in the Delta channels; the 1995 DEIR/EIS did note, however, that algal blooms on the reservoir islands could cause periodic differences between the levels of DO on the reservoir islands and those in the channels.

The FOC terms direct Delta Wetlands to implement a program for DO that includes the following components:

Delta Wetlands will not discharge water for export if the discharge level is less than 6.0 milligrams per liter (mg/l) without authorization from the resource agencies.

Delta Wetlands will not discharge water for export if the discharge would cause the DO level in adjacent channels to fall below 5.0 mg/l.

Delta Wetlands will develop and implement a plan for monitoring DO in water stored on the reservoir islands and DO in Delta channels.

Incorporating this FOC term into the proposed project ensures that effects of project operations on DO would be less than significant.

MASTER RESPONSE 5. MITIGATION OF ENVIRONMENTAL EFFECTS RELATED TO USE OF RECREATION AND BOAT FACILITIES

In the 1995 DEIR/EIS, Delta Wetlands proposed to construct recreation facilities along the perimeter levees on all four Delta Wetlands Project islands. These facilities were included as part of the project description when Delta Wetlands submitted its application for water rights to the SWRCB and applied to USACE for authorization under the Clean Water Act (CWA) and Rivers and Harbors Act of 1899. Both the 1995 DEIR/EIS and the 2000 REIR/EIS provided conceptual descriptions of the recreation facilities and analyzed the effects that facility construction and operation would have on the environment. As described below, the water right permit issued by the SWRCB and the biological opinions issued by USFWS, NMFS, and DFG for the proposed project include terms and conditions governing construction and operation of these facilities.

The lead agencies received several comments on the 1995 DEIR/EIS about the effects of increased boating that would result from the implementation of the Delta Wetlands Project. There is a concern that if Delta Wetlands provided the number of proposed boat berths included in the design of recreational facilities on the project islands, boat use in the Delta would increase, resulting in increased impacts on aquatic resources. Many commenters voiced the concern that impacts created by wakes and wave wash from increased boat use could lead to erosion of levees and degradation of near-shore habitat and midchannel islands and shoals. Commenters also expressed a concern that boat use resulting from project implementation could increase turbidity and affect sensitive aquatic species that reside in or migrate through the Delta. The comment letters also described other potential effects of boat use on aquatic habitats that relate to an increase in the concentration of pollutants near docks resulting from improper dumping and potential fuel spills.

In addition to concerns about impacts on physical habitat, several comments focused on the concern that increased recreational opportunities on the Delta Wetlands Project islands would increase recreation-related vehicular traffic on Delta roadways, adversely affecting roadway safety and increasing the need for roadway maintenance. There was also concern that the addition of new recreation and boat facilities would increase the demand for public services, including fire and police protection and sewage systems to serve the boaters and the recreation andboat facilities. Commenters suggested that implementation of the project would result in an overall degradation of recreational boating experiences in the Delta.

In May 2001, Delta Wetlands removed construction of recreation facilities from its CWA and Rivers and Harbors Act permit applications; therefore, USACE will not include construction or operation of such facilities in any permit issued pursuant to Delta Wetlands' current application. Nevertheless, as information for the reader, this FEIS includes the conceptual descriptions of the recreation facilities, the analysis of their environmental effects, and responses to comments on the 1995 DEIR/EIS and 2000 REIR/EIS about the facilities. Delta Wetlands may subsequently apply

for CWA and Rivers and Harbors Act permits for some or all of these recreation facilities; in such a case, separate environmental analysis would be required. The information developed in this EIS may be used in any subsequent environmental assessment as appropriate.

Issues Addressed in the 1995 DEIR/EIS and the 2000 REIR/EIS

The effects of increased recreational activities, including boating, that could result from implementation of the Delta Wetlands Project were discussed and analyzed in the following chapters of the 1995 DEIR/EIS:

Chapter 2, " Delta Wetlands Project Alternatives", provided a generalized description of the proposed recreation and boat facilities and boat docks as part of the project description. Recreation and boat facilities were described in more detail in Appendix 2, "Supplemental Description of the Delta Wetlands Project Alternatives".

Chapter 3J, "Recreation and Visual Resources", provided an analysis of impacts related to boat congestion and to a general decrease in the quality of the recreational boating experience in the Delta.

Chapter 3L, "Traffic and Navigation", addressed impacts generated by increased recreational traffic from vehicles and boats.

Chapter 3O, "Air Quality", provided an analysis of pollutant emissions from increased boating and recreational traffic on Delta roadways.

Chapter 3E, "Utilities and Highways", provided a discussion of impacts associated with the need for increased police and fire services that would result from project implementation. This chapter also addressed sewage disposal needs required by the proposed recreation and boat facilities.

This information is presented again in Chapters 2, 3J, 3L, 3O, and 3E in Volume 1 of this FEIS.

In response to comments on the 1995 DEIR/EIS, additional information about the issue of boat wake was included in Chapter 6, "Levee Stability and Seepage", of the 2000 REIR/EIS. A literature search and conversations with individuals with expertise in this area revealed that there are no current data on the impacts of wake action on channel islands. Because no data are available to quantify the relationship between boating and wake effects, it is not currently possible to estimate the effects that increased wake action resulting from increased boating use under the proposed project would have on erosion or habitat. However, the lead agencies recognize the potential for such effects. Therefore, additional consideration is given here to lessening the significance of adverse impacts created by boat wake that would result from project implementation. In addition, new information on the effects of the Delta Wetlands Project facilities on fish predation was included

in Chapter 5, "Fisheries", of the 2000 REIR/EIS. This information on wake action and fish predation is included in Chapters 3D and 3F, respectively, in Volume I of this FEIS.

Effects of Boat Wake on Aquatic and Channel Island Habitat

The wakes produced by boats propagate outward until they dissipate at the shoreline. Wave height and other characteristics vary with speed, size, type of watercraft, size of engine, hull displacement, and distance from shore (Asplund 2000). The resulting waves have the potential to deliver large amounts of erosive energy to the shoreline in a short period of time (Dorava and Moore 1997). The rate at which this erosion occurs depends largely on the shoreline substrate and the frequency and magnitude of the waves produced. Shoreline erosion may affect water clarity in near-shore areas by shading submerged aquatic plants and providing nutrients for algal growth. This erosion also can interfere with the use of shallow-water habitat by resident and migrant fish species, as well as wildlife species, at the land-water edge.

Boat wakes could adversely affect channel islands and shoals and marsh and riparian habitat along Delta sloughs. These habitats are described briefly below.

Channel Islands and Shoals

Channel islands and shoals are remnants of naturally occurring islands that existed before reclamation or of natural or old levees. They typically support tule marsh and, to a lesser extent, willow scrub and tidal mudflat habitats and associated wildlife and fish species. Some of these islands also support small patches of riparian woodlands with oaks, cottonwoods, alders, and willows. The relative isolation of these islands makes them important wildlife refuge areas during peak recreation months in spring and summer.

Channel islands and shoals are a complex habitat type that provides high habitat values for both terrestrial and aquatic species. Channel islands must be described individually because their physical features depend on parameters such elevation, width, location, and amount of human disturbance. To a large extent, an island's isolation from disturbance will determine how useful it will be in supporting wildlife habitat. Other important ecological functions of the islands include natural sediment supply, nutrient input, and areas of primary and secondary production. A variety of Delta fish species, including the federally listed and state-listed splittail and delta smelt, spawn in shallow water. Therefore, the channel island and shoal habitat provides the diversity, nutrients, and shelter from aquatic predators necessary for Delta fish to survive and to spawn successfully. Special-status plant species, including Suisun marsh aster, Delta tule pea, Delta mudwort, Suisun thistle, soft bird's-beak, and Mason's lilaeopsis, are also supported by these habitats.

Marsh and Riparian Habitat along Delta Sloughs

Sloughs are tidal channels of the Delta that create a link between upland rivers and San Francisco Bay. They are characterized as low-velocity, natural tributaries of Delta rivers that vary in width and depth, have gently sloped, vegetated sides, and are connected to the Delta (CALFED Bay-Delta Program 1999a). These areas supply high habitat values for both aquatic and terrestrial species by providing cover and protection from high velocity flows and wind. Marsh and riparian corridors associated with the sloughs are important nesting, refuge, breeding, and feeding areas for waterfowl. Riparian scrub, riparian forest, and open-water habitats associated with sloughs provide the complex habitat requirements for protected wildlife species, including the federally listed and state-listed giant garter snake, and special-status plant species, such as rose-mallow. In addition, several resident fish species, including splittail and delta smelt, may use the sloughs as spawning habitat. Wildlife use of these areas varies with the amount of open water and marsh, the extent and type of vegetation present, and surrounding land uses.

Mitigation Identified in the Final Operations Criteria to Address the Effects of Boat Wake

The issue of boating and wake effects was considered during endangered species consultation between the lead agencies and DFG, NMFS, and USFWS. As a result, the FOC terms developed in the consultation process include a measure (number 53) specifically intended to mitigate the effects of boat wake. Under this term, Delta Wetlands is required to contribute $100 per year for each net additional boat berth beyond pre-project conditions added to any of the four project islands. These funds will be in January 1996 dollars and adjusted annually for inflation. The monies collected as a result of this measure will be included as part of an aquatic habitat restoration fund. This fund will be used to purchase habitat from a mitigation bank or acquire and manage habitat in an alternative ownership and management arrangement acceptable to DFG. (See also page 55 of the DFG biological opinion in Appendix C of the 2000 REIR/EIS.)

This measure is an addition to the requirement that Delta Wetlands mitigate the effects of project construction and operation on aquatic habitat and shallow shoal habitat. The FOC terms have been adopted as part of the federal and state biological opinions for Delta Wetlands Project effects on listed fish species, and Delta Wetlands is required to incorporate these terms into the proposed project.

Additional Mitigation of Potential Impacts: Reduction in Boat Slips at Recreation and Boat Facilities

Comments received on the 1995 DEIR/EIS prompted the lead agencies and the project proponent to reexamine impacts created by increased recreational boating opportunities. As discussed above, the effects of increased recreational boating created by the Delta Wetlands Project

were discussed and analyzed in several chapters in the 1995 DEIR/EIS. A listing of each 1995 DEIR/EIS impact and finding of significance related to increased recreational boat use is shown in Table 2-1 of this volume. The following additional mitigation has been proposed in an attempt to reduce these impacts to a less-than-significant level.

> **Mitigation Measure RJ-1: Reduce the Number of Outward Boat Slips Located at the Proposed Recreation and Boat Facilities**. Delta Wetlands shall reduce the total number of outward (channel-side) boat slips proposed on the Delta Wetlands islands by 50%.

As stated above, Delta Wetlands has removed construction of recreation facilities from its CWA and Rivers and Harbors Act permit applications, and USACE will not include the construction of such facilities in any permits issued for the project at this time. Nevertheless, a discussion of the effectiveness of this mitigation measure is presented below. This information may be used in any subsequent environmental assessment of the recreation facilities as appropriate.

Delta boating use attributable to the Delta Wetlands Project would originate from the recreation facility boat docks. With the addition of this mitigation measure, the number of permanent docking spaces provided by the recreation and boat facilities would decline from 1,140 to 570 slips under Alternatives 1 and 2. Assuming 70% occupancy, this would reduce the number of boats that are provided permanent docking space under the proposed project (Alternative 1 or 2) from 798 to 400.

The following sections describe how implementing this mitigation measure can address the concerns raised in comment letters and would change the impact conclusions presented in the 1995 DEIR/EIS. The revised impact conclusions are shown in the last column of Table 2-1 and are reflected in impact discussions in Volume 1 of this FEIS.

Recreation-Related Vehicle and Boat Traffic

Projected boating use at the Delta Wetlands Project islands would contribute substantially to increases in boat traffic on Delta waterways and vehicle traffic on Delta roadways (see Chapter 3L). As described in Chapter 3L, implementation of the Delta Wetlands Project would increase peak-hour roadway traffic volumes during project operation (see Table 2-1 of this volume). The majority of trips generated under these alternatives would be created by summer recreationists (e.g., boaters). Based on the significance criteria and the impact assessment methodology presented in Chapter 3L, the increase in peak-hour traffic volumes on Delta roadways without mitigation was considered to result in a significant impact.

Table 2-2 of this volume presents a comparison of recreational vehicle and boat trip generation (trips per day per season) that would result from implementation of the proposed project (Alternative 1 or 2) with and without the proposed 50% reduction in external boat slips. As shown in the table, implementation of the proposed mitigation measure would reduce recreational boater trips by 50%. However, implementation of the proposed project would still exceed the significance

Table 2-1. Impacts Discussed in the 1995 DEIR/EIS Related to Recreational Boat Use

Chapter	Impact #	Impact	1995 DEIR/EIS CEQA Finding	Finding After New Mitigation
3C	C-24	Increase in Pollutant Loading in Delta Channels	Significant and unavoidable	Adverse impacts are lessened, but not below a level of significance
3E	E-8	Increase in Demand for Police Services on the Delta Wetlands Project Islands	Less than significant with proposed mitigation	Less than significant with proposed mitigation
	E-9	Increase in Demand for Fire Protection Services on the Delta Wetlands Project Islands	Less than significant with proposed mitigation	Less than significant with proposed mitigation
	E-11	Increase in Demand for Sewage Disposal Services	Less than significant with proposed mitigation	Less than significant with proposed mitigation
3F	F-3	Potential Increase in Accidental Spills of Fuel and Other Materials	Less than significant	Less than significant
3J	J-4	Change in the Quality of the Recreational Boating Experience in Delta Channels	Significant and unavoidable	Adverse impacts are lessened, but not below a level of significance
3L	L-2	Increase in Traffic on Delta Roadways during Project Operation	Significant and unavoidable	Adverse impacts are lessened, but not below a level of significance
	L-7	Increase in Boat Traffic and Congestion on Delta Waterways during Delta Wetlands Project Operation	Significant and unavoidable	Adverse impacts are lessened, but not below a level of significance
	L-21	Increase in Traffic on Delta Roadways during Operation of Future Projects, Including the Delta Wetlands Project	Significant and unavoidable	Adverse impacts are lessened, but not below a level of significance
3O	O-2	Increase in CO Emissions on the Delta Wetlands Project Islands during Project Operation	Less than significant	Less than significant
	O-5	Increase in ROG Emissions on the Delta Wetlands Project Islands during Project Operation	Significant and unavoidable	Adverse impacts are lessened, but not below a level of significance
	O-6	Increase in NO_x Emissions on the Delta Wetlands Project Islands during Project Operation	Significant and unavoidable	Adverse impacts are lessened, but not below a level of significance
	O-17	Increase in Cumulative Production of Ozone Precursors and CO in the Delta	Significant and unavoidable	Adverse impacts are lessened, but not below a level of significance

Note: Although Delta Wetlands has removed construction of recreation facilities from its Clean Water Act permit application, the impact conclusions presented in this table assume that the recreation facilities would be constructed and operated.

Table 2-2. Comparison of Recreational Vehicle and Boat Trip Generation (trips/day) for Alternatives 1 and 2 with and without a 50% Reduction of Boat Slips

		Bacon		Webb		Bouldin		Holland	
Vehicle or Boat Type	Season	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation
Hunting-related vehicles	Nov-Jan	18	18	17	17	22	93	14	43
	Feb-May	0	0	0	0	0	0	0	0
	Jun-Aug	0	0	0	0	0	0	0	0
	Sept-Oct	0	0	0	0	0	0	0	0
Boating-related vehicles	Nov-Jan	34	68	34	68	27	58	17	36
	Feb-May	139	277	139	277	126	252	67	151
	Jun-Aug	243	485	243	485	221	441	132	265
	Sept-Oct	173	347	173	347	158	315	95	189
Other recreation-related vehicles	Nov-Jan	2	2	2	2	2	2	2	1
	Feb-May	8	8	8	8	8	8	6	5
	Jun-Aug	36	36	36	36	33	33	26	20
	Sept-Oct	16	16	16	16	14	14	11	9
Total recreation-related vehicles	Nov-Jan	54	88	53	87	51	153	32	80
	Feb-May	147	286	147	286	134	260	73	156
	Jun-Aug	279	521	279	521	254	474	158	284
	Sept-Oct	189	362	189	362	172	329	106	198
Hunting-related boats	Nov-Jan	18	18	18	18	22	93	14	43
	Feb-May	0	0	0	0	0	0	0	0
	Jun-Aug	0	0	0	0	0	0	0	0
	Sept-Oct	0	0	0	0	0	0	0	0
Boating-related boats	Nov-Jan	23	46	23	46	21	42	13	25
	Feb-May	93	185	93	185	84	168	51	101
	Jun-Aug	161	323	161	323	147	294	88	176
	Sept-Oct	116	231	116	231	105	210	63	126

Table 2-2. Continued

		Bacon		Webb		Bouldin		Holland	
Vehicle or Boat Type	Season	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation
Other recreation-related boats	Nov-Jan	0	0	0	0	0	0	0	0
	Feb-May	0	0	0	0	0	0	0	0
	Jun-Aug	0	0	0	0	0	0	0	0
	Sept-Oct	0	0	0	0	0	0	0	0
Total recreation-related boats	Nov-Jan	41	64	41	65	43	135	27	68
	Feb-May	93	185	93	185	84	168	51	101
	Jun-Aug	161	323	161	323	147	294	88	176
	Sept-Oct	116	231	116	231	105	210	63	126

Notes:
1) Although 10% of other recreationists would boat to the project islands, these boat trips are not included in this analysis because their origin is unknown.
2) Hunting-related boat trips are made on the interior of the project islands and are of much shorter duration than boating-related boat trips, which are made on the exterior of the islands.
3) Hunting-related boat trips would be made in small outboard fishing boats, whereas boating-related boat trips would be made in larger inboard-engine boats.

Sources: Anderson, Boyce, Camper, Cochrell, Holmes, Ruth, Wagner, Williams, and Winther pers. comms. See also Table 3L-5 of the 1995 DEIR/EIS.

criteria for peak-hour traffic volumes on local roadways. Therefore, the project impact on traffic would be lessened, but not below a significant level.

The impact of the proposed project on waterway traffic, described in Chapter 3L, is considered significant and unavoidable. As with roadway traffic, implementation of the proposed mitigation would greatly reduce the magnitude of this impact. However, it is still considered significant and unavoidable.

Roadway Safety and Maintenance

Several comments focused on concerns that increased traffic on local roadways, such as Jersey Island Road and Bacon Island Road, would decrease roadway safety and increase the need for roadway maintenance. One commenter also expressed concern that increased vehicle and boat traffic would require additional opening and closing movements of local bridges, specifically the Bacon Island Road bridge across Middle River, which could accelerate deterioration of recent bridge improvements. The 1995 DEIR/EIS reports that project implementation would reduce agricultural vehicle traffic on Delta roadways (see Impact L-4). Operation of slow-moving, heavy agricultural vehicles on public roadways can increase the frequency of traffic accidents and increase the frequency of routine roadway maintenance (i.e., repaving). Removing agricultural vehicles from the roadways would improve those conditions. However, increased vehicular traffic associated with use of the recreation and boat facilities would somewhat offset the improvements gained by removing agricultural traffic on the roadways. As described above, reducing the number of boat facilities would result in a corresponding reduction in recreational vehicle and boat traffic. Implementation of the proposed mitigation measure would therefore reduce the potential for wear and tear on local roadways and bridges associated with recreation-related vehicle and boat traffic. Impacts on roadway safety and maintenance resulting from project implementation would be considered less than significant with the proposed mitigation.

Air Quality

The reduction in the number of recreational boater trips and reduction in boat use that would accompany implementation of the proposed mitigation measure would reduce projected impacts on air quality. However, the impacts would remain significant and unavoidable (Table 2-1 of this volume).

Demand for Police and Fire Protection Services

A reduction in the number of boats using Delta Wetlands recreation and boat facilities would also correspond to a decrease in demand for police and fire services. Impacts related to the need for increased police and fire protection on the project islands are identified in the 1995 DEIR/EIS as Impacts E-8 and E-9 (see Table 2-1 in this volume). The proposed mitigation of these impacts includes the following measures:

Mitigation Measure E-3: Delta Wetlands would provide adequate lighting in and around buildings, walkways, parking areas, and boat berths.

Mitigation Measure E-4: Delta Wetlands would provide private security services for recreation and boat facilities and boat docks.

Mitigation Measure E-5: Delta Wetlands would incorporate design features from the Uniform Building Codes and Uniform Fire Codes into the design of the recreation and boat facilities and boat docks.

Mitigation Measure E-6: Delta Wetlands would coordinate with the county and the Local Agency Formation Commission (LAFCO) to incorporate Webb Tract and Bacon Island into an existing fire protection district or create a new fire protection district to serve these islands.

With the implementation of these measures, in addition to the new mitigation reducing the number of boat berths provided at recreation and boat facilities on project islands, the increase in demand for police and fire protection services would remain less than significant.

Demand for Sewage Facilities and the Potential for Accidental Spills

The potential for increased pollutant loading associated with recreational boat use is described as a significant and unavoidable impact on page 3C-36 in Chapter 3C of the 1995 DEIR/EIS (page 3C-40 in Chapter 3C of FEIS Volume 1). Pollutants could be discharged into channels adjacent to the Delta Wetlands Project islands and in other Delta channels from fueling and sewage pumping activities, domestic gray water, and litter. The frequency, magnitude, and precise location of incidental fuel and sewage discharges associated with these activities are unknown, but such discharges are likely to occur at the proposed boat docks. However, the relatively strong tidal currents in the channels that surround the Delta Wetlands habitat and reservoir islands would disperse most spills quickly.

Reducing the number of permanent docking spaces provided at the recreation and boat facilities would decrease the potential for accidental spills in Delta channels and reduce the need for sewage pump-out facilities. Impacts related to the potential increase in accidental spills of fuel and other materials are identified in the 1995 DEIR/EIS and FEIS Volume 1 as Impacts C-24 and F-3. The impact related to the increased demand for sewage disposal facilities is identified as Impact E-11. The Delta Wetlands Project would not provide sewage pump-out facilities because these facilities are widely available in the vicinity of the project islands and other locations throughout the Delta (see Figure 3E-4 in Chapter 3E in Volume 1 of this FEIS). As noted above, accidental spills of fuel and other materials related to recreational boating would have localized effects. With the addition of the proposed mitigation measure, the need for sewage facilities and the potential for accidental spills would be reduced substantially.

Permit Requirements for Recreation and Boat Facilities

The 1995 DEIR/EIS disclosed the adverse environmental effects of constructing and operating the proposed recreation and boat facilities on the Delta Wetlands Project islands. Although approval of the construction of these facilities was not part of the SWRCB's water right decision, the placement of docks in the channels would require a USACE permit under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act. Therefore, the 1995 DEIR/EIS and 2000 REIR/EIS addressed the environmental effects of constructing and operating the facilities.

The design details, square footage, and berth lengths given in the 1995 DEIR/EIS are preliminary; the analysis assumed a maximum facility size and maximum number of facilities to provide a worst-case analysis of potential effects of the recreation and boat facilities. The actual facility design and total number of facilities built would not exceed the assumptions in the analysis. However, specific design features for a particular facility may be subject to change before Delta Wetlands applies for entitlements and permits from regulating agencies (e.g., Contra Costa or San Joaquin County, the California State Lands Commission [SLC], and USACE).

In May 2001, Delta Wetlands removed construction of the recreation facilities from its permit application under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act; therefore, USACE will not approve construction of such facilities at this time. Delta Wetlands may subsequently apply for CWA and Rivers and Harbors Act permits for some or all of these facilities when specific designs for the facilities are complete. In such a case, separate environmental analysis would be required. Delta Wetlands would not be able to build recreation facilities without obtaining permits from USACE. The information developed in this FEIS may be used in any subsequent environmental assessment as appropriate.

Delta Wetlands also would not be able to build recreation and boat facilities without obtaining the development permits deemed necessary by Contra Costa or San Joaquin County. If, when specific design details are submitted, a local regulating agency determines that the NEPA and CEQA documentation already prepared for the project does not cover site-specific environmental impacts in enough detail, the agency may require additional environmental documentation before it will approve permits or entitlements.

Conclusion

With the implementation of the proposed mitigation measure described above and the terms and conditions of the biological opinions (i.e., the FOC), in addition to the mitigation measures described in the 1995 DEIR/EIS, the impacts associated with increased recreational boating resulting from project implementation would be greatly reduced. A reduction in the number of boat slips at the proposed recreation and boat facilities would lessen the adverse effects of boat wake on sensitive aquatic species and their habitats. To further mitigate the impacts of boat wake, DFG would collect fees to restore aquatic habitat such as channel islands and shoals. The proposed mitigation would

also lessen impacts on waterway and roadway traffic and air quality, but not to a less-than-significant level.

Demands for public services like sewage pump-out facilities and police and fire protection would also be greatly reduced. It should be noted that if, when specific recreation facility design details are submitted, USACE or a local regulating agency determines that the NEPA and CEQA analysis already performed for the project does not cover site-specific environmental impacts in enough detail, the agency may require additional environmental documentation before it will approve permits or entitlements.

MASTER RESPONSE 6. SIGNIFICANCE CRITERIA USED FOR THE WATER QUALITY IMPACT ANALYSIS

Summary of Comments

Several comments on the 1995 DEIR/EIS and the 2000 REIR/EIS questioned the appropriateness of the significance criteria that were used in the impact analysis for water quality. Specifically, commenters challenged the use of a 20% change in the existing numerical limit or mean value (for variables without numerical limits) of a water quality variable as a threshold for significance. Their challenges are based on the concern that any change for some constituents may unacceptably degrade resources that are already impaired. Commenters also misunderstood the assumptions on which the 20% significance threshold was based.

Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", addresses the significance criteria used to evaluate effects of the project on disinfection byproducts (DBPs), including trihalomethanes (THMs). Comments related to the significance of project effects on water treatment costs are also included in Master Response 7.

Requirements for Establishing Significance Criteria

The State CEQA Guidelines encourage each public agency to develop and publish thresholds of significance. The SWRCB has not published specific significance criteria for projects that affect Delta water quality; however, the SWRCB and U.S. Environmental Protection Agency (EPA) have established regulatory objectives and numerical standards, such as those contained in the 1995 Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary (1995 WQCP), to protect beneficial uses of Delta waters.

The State CEQA Guidelines direct that a change in the environment is not significant if it complies with a "standard". A standard is defined as, among other things, a quantitative requirement adopted by a public agency through a public review process. The criteria used to determine the

significance of effects of Delta Wetlands Project operations on water quality have been set to conform with existing objectives and standards. For Delta water quality variables for which no regulatory objectives or numerical standards have been set, the selected significance threshold is a percentage change from existing measured values that encompasses natural variability in water quality constituents.

Some commenters argue that the State CEQA Guidelines require that significance criteria be determined through a public forum. However, the requirement for a public review process applies only to thresholds of significance adopted "for general use as part of the lead agency's environmental review process" (State CEQA Guidelines 15064.7). This section of the State CEQA Guidelines encourages agencies to develop "general use" thresholds as a means of standardizing their environmental assessments. However, the SWRCB, in developing thresholds of significance for the Delta Wetlands Project, was not establishing thresholds for general use. Therefore, no public review process was required other than the CEQA requirements for review of an EIR.

Additionally, NEPA requires that an EIS disclose the direct, indirect, and cumulative effects of the proposed action but does not require significance determinations for individual project effects (40 CFR 1502.16).

Significance Criteria Used in the 1995 DEIR/EIS and the 2000 REIR/EIS

The significance criteria used for the analysis in the 2000 REIR/EIS are identical to those presented in the analysis of water quality effects in the 1995 DEIR/EIS, except that the THM criterion has been updated in response to changes in the federal Disinfection/Disinfection Byproducts (D/DBPs) Rule (see Master Response 7).

For the impact assessment analysis, it was assumed that there are benefits to maintaining water quality better than that specified by the numerical water quality criteria. Therefore, significance thresholds for variables with numerical water quality criteria were established at 90% of the specified water quality standards. A second significance criterion was based on the assumption that some changes may be substantial compared with the natural variability of the water quality variable under no-project conditions and could be considered significant impacts. This criterion, which was set at 20% of the applicable standard or mean condition, was challenged by commenters on the 1995 DEIR/EIS and 2000 REIR/EIS as too lenient. The description of this criterion in Chapter 4 of the 2000 REIR/EIS contained language that was misunderstood by reviewers; this text has been corrected and clarified in Chapter 3C of this FEIS as follows:

> A second significance criterion was based on the assumption that some changes may be substantial compared with the natural variability of the water quality variable under no-project conditions and could be considered significant impacts. Natural variability caused by tidal flows, river inflows, agricultural drainage, and biological processes in the Delta channels is sometimes quite large relative to the numerical

standards or mean values of water quality variables. Natural variability was assumed to be at least 10% of the specified numerical limit for variables with numerical limits or 10% of the mean value for variables without numerical limits. Measurement errors and modeling uncertainties were likewise assumed to be ~~about~~ at least 10% of the measured or modeled values. It would be unreasonable to establish a significance threshold that does not allow for project effects that fall within the range of natural variablity of the constituents in question; doing so would make effects attributed to the project indistinguishable from no-project conditions. Therefore, simulated changes that were less than 10% of either the numerical limit or the measured or simulated mean value of the variable were not considered to be ~~changes~~ identifiable. In other words, these changes ~~are not greater than~~ would be indistinguishable from the minimum range of assumed natural variability and model uncertainty. Based on professional experience, ~~the second (i.e., incremental) significance criterion~~ it was further considered reasonable that distinguishable changes from no-project conditions would be identified as significant when they would result in a variance greater than 10% of the mean or standard condition. This adds 10%, adding up to 20% of the numerical limits for water quality variables with numerical limits or 20% of the mean value for variables without numerical limits.

As discussed in Chapter 4, "Water Quality", of the 2000 REIR/EIS (see Chapter 3C of Volume 1 of this FEIS), the significance criteria for the project's water quality effects exceed the minimum requirements set by CEQA and NEPA in the following ways:

When regulatory standards exist for a given variable, the significance criteria are more restrictive than the established standards.

In the case of variables for which no standards exist, the significance criteria encompass the range of natural variability, measurement errors, and modeling uncertainty.

Assumptions Used in Establishing the Significance Thresholds

Natural Variability

Several comments challenged the inclusion of natural variability as a factor in the determination of impact significance.

As described in Chapter 3C of the 1995 DEIR/EIS and Chapter 4 of the 2000 REIR/EIS (see Chapter 3C of FEIS Volume I), natural variability caused by tidal flows, agricultural drainage, and biological processes in the Delta channels is sometimes quite large relative to the numerical standards or mean values of water quality variables. The significance threshold described above was based on the assumption that natural variability is *at least 10%*. As noted in Comment R8-26 from Contra Costa Water District (CCWD), natural variability in the Delta may range substantially higher than 10%; CCWD states that "all water quality parameters presented in [Chapter 4 of the 2000

REIR/EIS] have a 'natural variability' of at least 50%". The fact that levels of water quality parameters may vary widely, however, does not preclude the consideration of some range of natural variability in the significance threshold.

Confidence Intervals for Monthly Modeling

The impact assessment uses quantitative modeling to evaluate potential project impacts. An analytical tool such as the Delta Standards, Operations, and Quality model (DeltaSOQ) is inherently imprecise, and a level of uncertainty should be considered when the results of the model are reviewed. The level of uncertainty for DeltaSOQ was assumed to be at least 10%. Several commenters on the 1995 DEIR/EIS and 2000 REIR/EIS did not agree with the determination of modeling uncertainty or found it unacceptable. Some commenters note that the modeling uncertainty is likely higher than reported in the NEPA and CEQA documentation for the project (see, for example, Comment B7-14). Other commenters note that during project operations, the use of real-time field data and more precise computer modeling results should result in baseline confidence intervals of ±5%.

The purpose of the monthly DeltaSOQ modeling is to determine when differences between no-project and with-project conditions would occur and to estimate the relative magnitude of those differences. There are many unpredictable processes and events that may affect water quality in the Delta and cannot be simulated with available impact assessment models. Examples of such factors, which would influence conditions under both the No-Project Alternative and the project alternatives, include the following:

occasional slugs of relatively high-salinity San Joaquin River inflows,
intensive agricultural salt leaching following periods of drought, and
increases in dissolved organic carbon (DOC) concentrations in storm runoff.

In impact assessment modeling, however, these processes would influence the precision of the model results in the simulations of both the no-project condition and with-project conditions. Therefore, the simulated change between the no-project and with-project conditions is still valid for impact assessment purposes.

Although unpredictable conditions are not simulated in the monthly modeling, they would be considered in actual project operations because they would be detected through real-time monitoring. Delta Wetlands would be required to conduct such monitoring to demonstrate compliance with terms and conditions for project operations; this issue is discussed further in the next section.

The Distinction Between Significance Criteria and Mitigation Requirements

It should be noted that there is a distinction between significance criteria and the mitigation requirements for the project's water quality effects. The water quality significance criteria are used to develop mitigation measures on a monthly time step for evaluation based on the results of the monthly model. The actual implementation of the mitigation measure would require adjustment of the project's operations each day in response to daily monitoring of actual Delta conditions and the quality of water stored on the Delta Wetlands islands. The mitigation performance requirements used to trigger changes in project operations under the terms and conditions of the water right permit differ from the significance criteria. For example, the averaging period used for triggering mitigation has been adjusted to best match applicable standards or conditions (e.g., daily, 14-day averages, monthly, quarterly, annually, or long-term).

The significance criteria used in the NEPA and CEQA analysis are applied to *monthly* project operations. The Delta Wetlands Project generally would divert water for about 1 month each year and discharge for about 2 months each year. If the project were allowed a maximum monthly increase in variables of concern in exported water equal to 20% of the applicable objective or mean value in each of these 3 months, the overall change in the annual average export water quality would be only one-fourth (i.e., 3/12) of the maximum allowed monthly change, or less than 5% of the applicable objective or mean value annually.

Additionally, as shown in the evaluations of project impacts on water quality presented in the 1995 DEIR/EIS and the 2000 REIR/EIS, changes in water quality (salinity and DOC) under project operations may be higher or lower in any given month than concentrations under no-project conditions. Therefore, the net effects of the project on annual water quality may be less than the reported monthly increases.

Impact Conclusions

Some commenters request that the significance criteria be adjusted to identify *any* change in water quality parameters from no-project conditions as significant. In recognition that there is uncertainty in the modeling of project effects, these commenters suggest that the significance criterion be set at 5%. However, there is no evidence to suggest that any change in water quality that is *detectable* (i.e., greater than the modeling uncertainty) constitutes a significant water quality impact.

Changing the thresholds of significance as suggested by commenters would not change the significance findings for most of the project effects evaluated in the NEPA and CEQA analysis. Increases in export DOC, treatment plant THMs, and salinity are already identified as significant impacts in the impact analysis.

Mitigation Requirements in the Delta Wetlands Project Water Quality Management Plan

The Delta Wetlands Project Water Quality Management Plan (WQMP) negotiated by Delta Wetlands and California Urban Water Agencies (CUWA) clearly defines specific mitigation requirements for water quality variables, as well as a comprehensive approach to modeling, monitoring, and implementing mitigation measures. Monitoring and mitigation are to be based on both short-term (14-day) and long-term (3-year) project effects. For example, the WQMP requires that Delta Wetlands implement additional mitigation of long-term water quality impacts if project operations cause more than a 5% net increase in total organic carbon (TOC), total dissolved solids (TDS), bromide, and chloride in water diverted from the Delta for urban uses, averaged over 3 years.

These operating rules are described further in Master Response 7, "Analysis of Delta Wetlands Project Effects on Disinfection Byproducts", and in the WQMP, which is included in the Delta Wetlands–CUWA agreement in the Appendix to the Responses to Comments. The SWRCB included most of the terms and conditions specified in the WQMP into Delta Wetlands' water right permits.

MASTER RESPONSE 7. ANALYSIS OF EFFECTS OF THE DELTA WETLANDS PROJECT ON DISINFECTION BYPRODUCTS

Summary of Issues

The lead agencies received several comments on the 1995 DEIR/EIS and 2000 REIR/EIS about the methodology used to evaluate the potential effects of the Delta Wetlands Project on DBPs, including THMs and bromate. The comments focused on:

- appropriate methods of estimating DBP formation at water treatment plants,
- incorporation of the revised EPA rules adopted since publication of the 1995 DEIR/EIS, and
- economic effects of increased water treatment costs.

These comments are discussed below.

Additionally, the Delta Wetlands Project WQMP negotiated by Delta Wetlands and CUWA in October 2000 includes rules governing project operations to minimize or avoid project effects on DBPs, including THM and bromate. Inclusion of the operating parameters and DBP prediction methods described in the WQMP addresses the concerns expressed in comments on the 1995 DEIR/EIS and 2000 REIR/EIS. These operating parameters are summarized below. The full text

of the WQMP is provided in the Delta Wetlands–CUWA agreement in the Appendix to the Responses to Comments.

Results of the 1995 DEIR/EIS and 2000 REIR/EIS Analyses

One of the major variables assessed in Chapter 3C, "Water Quality", of the 1995 DEIR/EIS is DOC, the major THM precursor in water treated by chlorination for municipal use.

Project effects on DOC and THMs were reconsidered in the 2000 REIR/EIS. Chapter 4 of the 2000 REIR/EIS (see Chapter 3C of FEIS Volume I) and Appendix G of the 2000 REIR/EIS described the methods and assumptions used in the updated analysis. The 2000 REIR/EIS considered:

the range of DOC loading estimates that were presented in the 1995 DEIR/EIS,

new data on Delta water quality collected since the 1995 DEIR/EIS was released, and

the range of DOC loading estimates calculated from the results of laboratory experiments using flooded peat soil and the estimates presented by expert witnesses in testimony at the SWRCB water right hearing in 1997.

Because of the substantial disagreement among experts about the appropriate levels of DOC loading to use in estimates of Delta Wetlands Project effects, the analysis in Chapter 4 evaluated effects for a wide range of DOC loading estimates. The range encompassed the loading rates observed in Delta agricultural drainage and in field and laboratory studies of DOC loading from peat soil on Delta islands.

As reported in the 1995 DEIR/EIS, the evaluation found project impacts on DOC and THMs to be significant. The same mitigation measures that were recommended in the 1995 DEIR/EIS were recommended in the 2000 REIR/EIS to reduce these impacts to a less-than-significant level. This mitigation is designed to accommodate the uncertainty about the loading of DOC from the project islands; it consists of reducing and/or delaying project discharges to minimize effects on concentrations of export DOC and bromide and resulting effects on THM formation at treatment plants. Thus, the mitigation is designed to be effective regardless of the actual increases in bromide and DOC concentrations observed under project implementation.

Chapter 4 of the 2000 REIR/EIS (see Chapter 3C of FEIS Volume I) described how the proposed mitigation of DOC increases would be implemented to control Delta Wetlands Project effects on export DOC concentrations under extreme (worst-case) DOC loading conditions. It also discussed how the mitigation would be adjusted to meet any mitigation requirement specified in water right permit terms for the project.

The WQMP uses a similar method for mitigating project impacts on TOC. See "Delta Wetlands Project Water Quality Management Plan" below.

Disinfection Byproduct Prediction Methods

Commenters on the 1995 DEIR/EIS and 2000 REIR/EIS and parties to the water right hearing disputed the accuracy of the methods for determining the formation of DBPs, including THMs, as a function of export salinity (bromide) and DOC concentration. They suggested that project effects could be estimated more accurately by using revised methods for predicting the relationship between levels of DOC and salinity and the formation of THMs and other DBPs at municipal water treatment plants. Appendix G of the 2000 REIR/EIS describes the updated methods recommended by commenters on the 1995 DEIR/EIS. The accuracy of these methods remains an area of controversy.

Trihalomethane Calculations

Commenters on the 1995 DEIR/EIS requested that the method used to predict THM formation be revised based on a new equation developed by Malcolm Pirnie. Appendix G of the 2000 REIR/EIS compared the revised THM equation with the original THM equation; see "Calculations Using the Malcolm Pirnie Equation". The new equation is more sensitive to a change in bromide, but less sensitive to a change in DOC.

As discussed in Appendix G, the new Malcolm Pirnie equation was simplified for use in the 2000 REIR/EIS impact analysis. Several commenters on the 2000 REIR/EIS disagreed with the simplification of the equation. The simplification addressed two difficulties encountered in the use of the new equation for the impact analysis.

Applying the new equation to the available data of actual treatment plant (Penitencia Treatment Plant) operations provided by CUWA to the lead agencies showed that under the operating conditions documented by CUWA, the treatment would have violated the THM standard; however, in actual practice, treatment plant operators do not allow the standard to be violated. It must be assumed for purposes of the impact assessment that under no-project conditions, treatment would not result in exceedances of the standard.

Furthermore, the new equation contains several variables of treatment plant operating conditions, such as temperature, pH, treatment time, and ultraviolet absorbance (UVA), that cannot be predicted in the analysis and must be assumed for impact assessment purposes to be held constant. The equation was therefore simplified to represent the relationship between THM and those equation terms that are independent of decisions by treatment plant operators (levels of export chloride and DOC) and to recognize that the existing standard would be met under no-project conditions. It is important to note that this modification did not change the sensitivity of the relationships between THM and DOC or THM and bromide found in the new Malcolm Pirnie equation.

The impact analysis evaluates changes between no-project and with-project conditions; using this simplified equation allowed for a more meaningful evaluation of whether project impacts would increase THM concentrations to within 90% of the standard because it allowed with-project conditions to be compared to no-project conditions that meet the standard.

The THM concentrations estimated with either the old or the new Malcolm Pirnie equation are much more sensitive to the operational parameters of treatment plants than to the small expected changes in DOC or bromide caused by Delta Wetlands operations. Nevertheless, the impact analyses in both the 1995 DEIR/EIS and 2000 REIR/EIS conclude that increases in THM concentrations resulting from proposed project operations are a significant impact and that mitigation would be required.

The WQMP includes a recommended method for monitoring DOC and salinity (bromide) and predicting THM formation using the new Malcolm Pirnie equation (see "Delta Wetlands Project Water Quality Management Plan" below).

Bromate Formation

Commenters on the 2000 REIR/EIS also questioned why the analysis of project effects did not include a quantitative analysis of potential impacts of the proposed project on bromate formation. Appendix G of the 2000 REIR/EIS includes an evaluation of the Ozekin equation, a quantitative method used to predict bromate formation at water treatment plants. An evaluation of the bromate formation data indicated that the Ozekin equation overpredicts bromate formation.

Delta Wetlands Project operations would not directly result in bromate formation. Project operations could affect DOC and salinity, which are believed to contribute to bromate formation at water treatment plants. As described above for THM, bromate concentrations estimated with the Ozekin equation are much more sensitive to the operational parameters of treatment plants than to the small expected changes in DOC or bromide caused by Delta Wetlands operations. Additionally, changes in DOC and salinity caused by the project would result in more dramatic changes in the formation of THM predicted using the simplified new Malcolm Pirnie equation than the change in bromate predicted using the Ozekin equation. Therefore, mitigation measures implemented to reduce or avoid project effects on THM would be more stringent than mitigation measures used to reduce predicted bromate formation. Although the analysis in the 2000 REIR/EIS recognizes that formation of bromate at the water treatment plants is a potential effect of the project, the evaluation of potential project effects on THM concentrations is comprehensive enough to address commenters' concerns about DBPs in general.

The WQMP includes a recommended method for monitoring DOC and salinity (bromide) and predicting bromate formation using a modified Ozekin equation (see "Delta Wetlands Project Water Quality Management Plan" below).

Haloacetic Acid Formation

Formation of haloacetic acids is a function of the bromide and DOC concentration but is strongly dependent on the treatment process employed. Also, there is no available model for estimating the formation of haloacetic acids. The 1995 DEIR/EIS and 2000 REIR/EIS analyses therefore focused on changes in bromide and DOC concentrations as the most important indicators of potential project effects on treated drinking water supplies.

U.S. Environmental Protection Agency Rules for Disinfection Byproducts

Commenters stated that the NEPA and CEQA analysis should acknowledge revisions to drinking water standards for DBPs that have been adopted or proposed by EPA since the 1995 DEIR/EIS was published.

The section in Chapter 4 of the 2000 REIR/EIS entitled "Changes in Disinfection Byproduct Rules" (see page 3C-64 of Chapter 3C in FEIS Volume I) described new or revised standards that have been adopted or proposed regarding DBPs in treated drinking water since the 1995 DEIR/EIS was released. EPA's maximum contaminant level (MCL) for THM concentrations in drinking water has been revised from 100 to 80 micrograms per liter (Fg/l). Because THM concentrations vary seasonally, the THM standard is applied to a moving annual average based on quarterly or monthly samples at the treatment plants.

The new rules ("Stage 1" rules) also require drinking water utilities to remove TOC from influent before treatment. These changes in DBP rules have led to increased costs for water treatment plant operations. In response to these changes, the significance threshold for THM effects was modified in the 2000 REIR/EIS impact assessment to reflect the more stringent (Stage 1) rules for DBPs that EPA adopted after the 1995 DEIR/EIS was released.

EPA has also proposed future ("Stage 2") DBP rules. According to CUWA in comments on the 2000 REIR/EIS, the proposed Stage 2 rules, which are expected to go into effect in 2002, would retain the numerical THM standard of 80 Fg/l established in Stage 1; however, the Stage 2 rules may revise the averaging method used to monitor compliance (see Comment Letter R4). CUWA reports that using the newly proposed averaging method results in an equivalent THM standard of 67 Fg/l.

Commenters on the 2000 REIR/EIS acknowledge that future DBP rules (including the Stage 2 rules) are uncertain, but they request that the lead agencies revise the thresholds of significance and mitigation strategies presented in the document to consider a treatment plant operator's ability to comply with future standards and the impact on water treatment costs.

The analysis of Delta Wetlands Project impacts looked at Delta Wetlands' *proportional* contribution to THM formation at treatment plants; the significance thresholds are therefore based on changes in the levels of THM precursors. Adopting more stringent THM standards in the future would change the ability of a water treatment operator to meet the standard under both the baseline,

or no-project, conditions and the with-project conditions. The relative contribution of project operations to THM precursors would remain the same.

In addition, water treatment utilities will be required to adjust the treatment process (e.g., eliminate prechlorination) to meet future standards that are more stringent. These adjustments would reduce THM concentrations under both no-project and with-project conditions.

Lastly, it is not appropriate for the lead agencies to speculate on potential future standards for drinking water. As exemplified by CUWA's comments on the description of potential Stage 2 rules provided in the 2000 REIR/EIS, changes to standards to regulate DBPs—including THMs—are still being considered; the proposed standards are likely to change before being adopted by EPA.

The Delta Wetlands WQMP includes operational screening criteria that are based on existing state and federal standards for DBPs and their precursors. The WQMP states, "Should drinking water DBPs, contaminants or precursors, or any other drinking water contaminants be further regulated under state or federal law, the [water quality management and action board] shall recommend that the SWRCB amend the screening criteria to ensure that the intent of the [WQMP] drinking water quality protection principles continues to be met". Therefore, changes in future DBP rules would be used to modify the operational constraints on the project under the WQMP.

Economic Impacts

Some commenters on the 1995 DEIR/EIS and 2000 REIR/EIS and parties to the water right hearing have argued that economic effects on treatment plant operators (i.e., increases in treatment costs) that could result from project-related increases in salinity and DOC concentrations should be considered significant impacts. They request that the significance criteria for evaluating project effects on TOC be adjusted to account for increased treatment plant costs associated with TOC removal requirements and higher disinfectant doses.

The issue of addressing changes in treatment plant costs was discussed in the section on impact significance criteria in Chapter 4 of the 2000 REIR/EIS, and in that chapter's evaluation of project effects on THM formation (see Chapter 3C in FEIS Volume 1). As discussed in these sections, the State CEQA Guidelines state that economic changes resulting from a project shall not be treated as significant effects on the environment except when the economic changes lead to environmental impacts. Similarly, NEPA requires discussion of economic effects only to the extent that they are interrelated with environmental impacts. CEQA and NEPA do not require a significance determination of the economic impacts on treatment plant operators. Therefore, although this discussion acknowledges that the Delta Wetlands Project may have an effect on the water treatment costs for downstream water users, the economic effect alone is not treated as a significant environmental effect and does not require separate mitigation.

The State CEQA Guidelines also state that lead agencies may consider economic changes when they determine that a physical change is considered significant. Even without considering

economic effects, the environmental impact of the Delta Wetlands Project on water quality degradation is deemed significant, and mitigation has been proposed. Therefore, no changes to the significance criteria are needed. See also Master Response 6, "Significance Criteria Used for the Water Quality Impact Analysis".

Delta Wetlands Project Water Quality Management Plan

In October 2000, Delta Wetlands submitted a WQMP to the SWRCB that further addresses the potential effects of project operations on DOC and salinity concentrations at the export pumps and CCWD diversions. The WQMP was included in a protest dismissal agreement with CCWD and in an agreement to resolve certain permit issues with CUWA; the full text of the agreements is provided in the Appendix to the Responses to Comments. These agreements address these parties' concerns about the potential effects of the project on water quality parameters, including salinity, DOC, and THMs.

By entering into the agreements, Delta Wetlands has committed to following an adaptive management approach that includes the following:

an annual plan;

monitoring water quality parameters, including salinity and DOC concentrations; and

implementing operational controls if Delta Wetlands Project operations result in significant effects, including causing unacceptable increases in THM precursors at any water treatment plant.

Specific operating rules related to project effects on DOC, DBPs, and salinity are described below.

Total Organic Carbon

The WQMP requires monitoring of project-related TOC loading that could cause an increase in water treatment costs. The WQMP states that the operational screening criteria for TOC, calculated as a 14-day average or the average for the duration of the discharge (whichever time period is shorter), are triggered when project operations would cause:

an increase in TOC of more than 1.0 mg/l at the urban intakes; or
TOC concentrations at the urban intakes to exceed 4.0 mg/L (±0.2 mg/l); and
TOC concentrations at a water treatment plant to exceed 4.0 mg/L (±0.2 mg/l).

If project operations were predicted to exceed these criteria, Delta Wetlands would modify operations (e.g., reduce or reschedule discharges) as necessary to reduce project impacts on TOC. The WQMP also requires that Delta Wetlands implement additional mitigation of long-term

water quality impacts if project operations cause more than a 5% net increase in TOC concentration in water diverted from the Delta for urban uses, averaged over 3 years.

Formation of Disinfection Byproducts

The Delta Wetlands WQMP includes screening criteria intended to prevent project-related DBP precursor loading that may affect the health of water users or contribute to a violation of a health regulation by a water treatment plant. As described above for TOC, Delta Wetlands would be required to modify project operations if it caused or contributed to the following conditions, calculated as a 14-day average or the average for duration of the discharge (whichever time period is shorter):

modeled total THM (TTHM) concentrations in drinking water in excess of 64 Fg/l (±3.2 Fg/l), as calculated in the raw water of an urban intake in the Delta;

modeled bromate concentrations in drinking water in excess of 8 Fg/l (±0.4 Fg/l), as calculated in the raw water of an urban intake in the Delta;

predicted TTHM concentrations in drinking water in excess of 64 Fg/l (±3.2 Fg/l), as calculated from measurements at the outlet of a water treatment plant; or

predicted bromate concentrations in drinking water in excess of 8 Fg/l (±0.4 Fg/l), as calculated from measurements at the outlet of a water treatment plant.

The WQMP outlines the initial assumptions that would be used to model TTHM and bromate. The revised Malcolm Pirnie model and a modified Ozekin equation model are used as the basis for predicting changes in TTHM and bromate concentrations; see Attachment 3 to the WQMP for more details.

Salinity

The Delta Wetlands WQMP includes screening criteria intended to minimize salinity impacts associated with project discharges. As described above for TOC, Delta Wetlands would be required to modify project operations when project operations cause the following conditions, calculated as a 14-day average or the average for duration of the discharge (whichever time period is shorter):

an increase in salinity of more than 10 mg/l chloride at one or more of the urban intakes, or

a salinity increase at the urban intakes in the Delta that exceeds 90% of an adopted salinity standard.

The protest dismissal agreement between Delta Wetlands and CCWD includes additional restrictions on project operations related to salinity impacts, including restrictions on Delta Wetlands diversions as a function of X2 location.

The WQMP also requires that Delta Wetlands implement additional mitigation for long-term water quality impacts if project operations cause more than a 5% net increase in TDS, bromide, and chloride in water diverted from the Delta for urban uses, averaged over 3 years.

Relationship between the Delta Wetlands Water Quality Management Plan and Mitigation Proposed in the NEPA and CEQA Analysis

The terms of the WQMP add specificity to the mitigation proposed in the 1995 DEIR/EIS and 2000 REIR/EIS analyses; therefore, they provide a greater level of protection than Mitigation Measures C-4 (export salinity), C-5 (export DOC), and C-6 (THMs in treated drinking water). Many of the comments on the water quality impact analysis have been resolved through adoption of Delta Wetlands' agreements with CUWA and CCWD. The SWRCB included the terms of these agreements as replacement mitigation for Mitigation Measures C-4, C-5, and C-6 in the terms and conditions of the Delta Wetlands water right permit.

MASTER RESPONSE 8. LEVEE STABILITY ANALYSIS AND WORST-CASE CONDITIONS

Several commenters on the 2000 REIR/EIS noted that the levee stability analysis presented in Appendix H, "Levee Stability and Seepage Technical Report", does not assess the most severe levee and soil conditions that may be encountered on the reservoir islands. Commenters stated that "a levee system is only as good as its weakest link" and that, therefore, the levee analysis should address the most extreme or worst-case conditions. The elements of the long-term levee stability analysis questioned by commenters include:

- existing levee geometry, specifically water-side slopes;
- soil conditions, including soil strength and permeability and potential for liquefaction;
- water level in the adjacent slough under flood stage; and
- the magnitude of the design earthquake.

This master response addresses questions about the levee stability analysis presented in the 2000 REIR/EIS and describes the conservative assumptions used in the analysis. The response also provides information about CEQA and NEPA requirements for analysis of environmental impacts.

CEQA and NEPA Requirements for Analysis of Worst-Case Conditions

CEQA and NEPA require an agency to use its best efforts to analyze and disclose the potential environmental effects of a proposed project; an exhaustive treatment of issues is not required as part of the CEQA-NEPA analysis. CEQA states that an EIR should discuss the significant effects on the environment with "emphasis in proportion to their severity and probability of occurrence". (State CEQA Guidelines Section 15143.) CEQA requires that lead agencies make a good-faith effort to fully disclose the project's foreseeable environmental effects; however, lead agencies are not required to speculate on unlikely effects. The lead agency is not required to perform a "worst-case" analysis if, after thorough investigation, it determines that an evaluation of certain environmental effects would be too remote and speculative. In these instances, the EIR must only note that the analysis is not reasonable within the agency's good-faith effort at full disclosure. (State CEQA Guidelines Sections 15144, 15145.) Throughout the 1995 DEIR/EIS and 2000 REIR/EIS, the lead agencies make a good-faith effort to fully disclose the foreseeable environmental effects of the Delta Wetlands Project. The recommended mitigation measures were designed both to address the effects that could occur under the project's most likely scenario and to ensure environmental protection under extreme conditions.

In 1996, the NEPA regulations were revised to remove the requirement of a "worst-case"analysis because the requirement often resulted in expensive and unreasonable technical studies and analyses. NEPA currently contains a provision that refers to unforeseeable effects as "incomplete or unavailable information". Environmental effects must be studied and discussed in an EIS only when the cost of the analysis is not "exorbitant". If the information is not available at an appropriate cost, the EIS must disclose that the information is unavailable and indicate how the subject for which information is unavailable relates to the assessment of reasonably foreseeable environmental effects. (40 CFR 1502.22.)

Levee-Stability Analysis Presented in the 2000 REIR/EIS

The levee-stability analysis presented in the 2000 REIR/EIS considered both the dynamic and static stability of the proposed levee improvements by using four cross sections, two for each of the reservoir islands. The cross sections were selected to be reasonably representative of conditions that would be encountered on the reservoir islands and to allow for conservative estimates for stability issues; however, these cross sections would not reflect the worst-case scenario. For this reason, the results of the analyses can be considered representative of stability conditions in most parts of the subject levees, but not representative of the worst-case conditions.

The purpose of the levee stability analysis is to:

evaluate Delta Wetlands' proposed levee design,
determine whether there is a potential for a fatal design flaw, and
evaluate the project's environmental impacts.

The levee stability analyses were designed to conservatively model conditions that exemplify most of the extent of the levees. The extremes (i.e., worst-case conditions) are expected to represent only a small percentage (less than 10%) of the extent of the levees. Because these critical cases are expected to represent a small percentage of the reservoir islands' levees, they are not expected to have significant engineering, environmental, or financial impacts, and they can be addressed during the final design phase of the project (see "Role of Final Design" below).

Although they do not make up a worst-case analysis, the levee stability analyses conducted for the 2000 REIR/EIS are conservative. A conservative slope stability analysis is one that uses estimates of the various parameters affecting stability that are expected to yield factors of safety (FSs) on the low (i.e., conservative) side of the most probable value. These parameters include the geometry and stratigraphy of the levee sections analyzed; the shear strengths of various soil layers; the water tables in the slough and in the reservoir island; and the earthquake loads for dynamic stability. Responses to specific questions about some of these parameters and the assumptions that went into the levee stability analysis are provided below.

Existing Water-Side Slopes

Commenters indicated that, based on their experience, the existing conditions for the water-side slopes do not represent worst-case conditions. The cross sections used in the analysis were selected to be representative of typical conditions for the reservoir islands. The steepest channel-side slopes analyzed were about 2.2H:1V (horizontal:vertical). In some places, primarily on the outside banks of curved channel reaches, existing channel-side levee slopes are steeper than 2.2:1; however, gentler slopes are also present in some places. A slope of 2.2:1 is a representative average of observed channel-side levee slopes.

Soil Strength Parameters

Soil shear strength parameters used in the levee stability analyses were derived from a combination of sources. These include:

strength tests on soils in the area conducted by Harding Lawson Associates (HLA);

published correlations between the index properties of soils (e.g., water content, density, grain size, plasticity), their resistance to penetration by drilling, and their shear strength; and

published and unpublished results of various laboratory tests.

Shear strength parameters for sandy soils were based on a combination of published experimental data on the relationship between shear strength and penetration resistance (based on field measurements), professional judgment, and experience with similar materials.

Shear strength parameters for peat were estimated using:

the results of HLA's strength tests on peat in the area;
published data on similar materials; and
unpublished research data from the University of California, Davis.

Each of the sources cited above provides a range of shear strength values. The geotechnical engineers who performed the levee stability analyses chose drained and undrained (saturated) shear strength values conservatively. In other words, shear strength values used in the analysis were selected at the low end of the range of values provided in the sources listed above. Section 3.3.4 of Appendix H provides a description of the soil parameters used in the levee stability analysis.

Potential for Liquefaction

Liquefaction refers to the condition in which soils or sediments lose their effective strength and behave much like a liquid. Liquefaction commonly occurs as a result of seismic load, and it occurs only in saturated materials (those that contain groundwater). Several commenters note that Appendix H of the REIR/EIS understates the potential for liquefaction of soils found in the Delta. Additionally, a few commenters point out that there is a potential for shallow deposits of Holocene sand, which may have a high potential for liquefaction.

The commenters are correct that the text of Appendix H understates the potential for liquefaction in the Delta; however, the analysis of dynamic levee stability accurately reflects a high potential for liquefaction in the analyzed soils. The review of the borings drilled in the proposed reservoir islands indicates that the upper 5–10 feet of the shallow sand alluvium are loose and saturated. Therefore, the potential for liquefaction is high. Should there be a severe earthquake in the region, liquefaction-induced damage to the Delta levees could be substantial under both the no-project and with-project condition.

The residual strength of the upper sand alluvium after liquefaction was incorporated into the dynamic levee stability model (see Appendix H of the 2000 REIR/EIS). A soft/loose foundation layer under the levees was used in the model to represent both the peat and the loose sands that are subject to liquefaction. The deeper portion of the sand alluvium is described as dense to very dense and hence not susceptible to liquefaction. These foundation conditions are the same under the baseline (no project) and proposed project.

The description of levee foundation materials used in the stability analyses was based on a review of the borings drilled in the proposed reservoir islands. No deposits of Holocene soil were located in the cross sections analyzed. During final design, site-specific subsurface testing would be conducted (see "Role of Final Design" below).

Water Table Elevations

As stated in Appendix H of the 2000 REIR/EIS, reservoir island and slough-side water levels were selected to produce critical cases. For the analysis of the existing condition of the slope toward the island, the water level in the slough was assumed to be at a flood elevation level of +6 feet. Several commenters state that the maximum peak flood elevation of +7.2 feet should have been used instead. As noted in Appendix H, the flood stage condition of +7.2 feet is a short-term condition. Gage recordings and historical data confirm that the maximum peak flood occurs for a short period of time (i.e., hours). The 7.2-foot flood-stage condition does not last long enough to establish the subsurface conditions that affect levee stability in the long term. Therefore, the 7.2-foot flood-stage condition does not represent the steady-state condition. The flood-stage level of 6.0 feet was used in the levee stability analyses to avoid the compounding of conservative assumptions that result in an unrealistically conservative level of evaluation.

Design Earthquake

The design earthquake used in the seismic evaluation of the reservoir levees is appropriate for the NEPA and CEQA analysis. The ground motions at the project site for the earthquake event with a 10% probability of exceedance in 50 years is also the maximum credible earthquake on the Midland Thrust fault, which is the controlling fault for the project islands. The ground motions used for the project are similar to the ground motions considered in the evaluation of the seismic vulnerability of the Delta levees conducted by the CALFED Levees and Channels Technical Team, Seismic Vulnerability Sub-Team (CALFED Bay-Delta Program 1999b).

Recommended Mitigation Measures to Improve Levee Stability

The mitigation measure on page 6-21 in Chapter 6 of the 2000 REIR/EIS (page 3D-4O of FEIS Volume 1) requires that Delta Wetlands adopt a final levee design that achieves a recommended FS of 1.3 and reduces the risk of levee failure on the water-side slopes. The recommended minimum FS of 1.3 is consistent with DWR's recommendations under Bulletin 192-82 for rehabilitation of nonproject levees in the Delta; this standard is more conservative than USACE's standard for nonfederal Delta levees of 1.25. This mitigation measure was designed to address the reduction in FS that could occur under either typical or extreme levee and soil conditions. Therefore, the NEPA and CEQA analysis addresses the "worst-case" condition by requiring Delta Wetlands to design levees that meet the recommended minimum FS, regardless of existing levee conditions.

Additionally, the lead agencies recognize that if water is stored above +4 feet elevation on the reservoir islands, Delta Wetlands will need to propose final levee designs that meet the design criteria of DWR's Division of Safety of Dams (DSOD). The DSOD criteria for design and construction would be more conservative than the minimum standard recommended in the mitigation measure.

Role of Final Design

The level of project detail presented in the 2000 REIR/EIS is appropriate for purposes of CEQA and NEPA impact analysis and for determining the general feasibility of Delta Wetlands' proposal for levee stability and seepage control. However, the detailed aspects of the Delta Wetlands Project's levee design would be worked out as a part of the final design phase of the project. Further analyses are typically carried out as a part of the final design phase, and are much more detailed than the preliminary analyses required for the NEPA and CEQA evaluation.

During the detailed design phase, Delta Wetlands plans to implement an extensive and detailed subsurface exploration program along the reservoir island levees, followed by further site-specific stability analyses. These detailed studies will identify extreme soil and levee conditions and will aid in the development of detailed site-specific designs, including designs for steepness of slope and overall geometry, to ensure levee stability.

Delta Wetlands presented more information about its plans for a final design (see Exhibit DW-95 [Tillis testimony 2000]). The steps for final design described by Delta Wetlands include the following:

Characterize levee materials.

Identify locations for onsite borrow pits.

Complete detailed surveys to determine existing geometry.

Collect data on local wind conditions and currents.

Evaluate the level of ground motions expected during seismic events.

Perform analyses of stability and settlement.

Identify high-seepage areas and consider methods to control high seepage (e.g., cutoff walls).

Design erosion protection for interior and exterior levee slopes.

The results of these steps would be documented in design reports, construction plans, and technical specifications.

Additionally, the water right protest dismissal agreement between Delta Wetlands and East Bay Municipal Utility District (EBMUD) establishes a Design Review Board. The duties of the Design Review Board include reviewing plans and specifications for levee designs, reviewing construction monitoring results, and confirming that the project design and implementation meets the design objectives. The full text of the Delta Wetlands–EBMUD protest dismissal agreement is provided in the appendix to this volume of the FEIS.

Chapter 3. Comments and Responses to Comments on the 1995 Draft Environmental Impact Report/ Environmental Impact Statement

Chapter 3. Comments and Responses to Comments on the 1995 Draft Environmental Impact Report/ Environmental Impact Statement

This chapter contains the comment letters received on the 1995 DEIR/EIS followed by responses to those individual comments. Comment letters and responses to comments are arranged in the following order:

Section A: Federal Agencies
Section B: State Agencies
Section C: Local Agencies
Section D: Special Interest Groups
Section E: Individuals
Section F: Public Hearing

Each letter and each comment within a letter have been given a number. Responses are numbered so that they correspond to the appropriate comment. Where appropriate, responses are cross-referenced between letters or with a master response.

Changes to the text of the 1995 DEIR/EIS that are made in response to comments are shown with a line through the text that has been deleted (~~strikeout~~) or double underlining where new text has been added. These changes have been incorporated into the corresponding chapters in Volume 1 of this FEIS.

Table 3-1 provides a list of all agencies and persons who submitted comments on the 1995 DEIR/EIS during the public review period.

Table 3-1. List of Comment Letters on the 1995 DEIR/EIS for the Delta Wetlands Project

Category	Commenter	Date	Letter #
A. Federal Agencies	Advisory Council on Historic Preservation	10/25/95	A1
	U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service	10/26/95	A2
	Department of Health & Human Services, U.S. Public Health Service	11/20/95	A3
	U.S. Department of Commerce, Office of the Under Secretary for Oceans and Atmosphere (National Oceanic and Atmospheric Administration)	11/27/95	A4
	U.S. Department of the Interior, Office of the Secretary, Office of Environmental Policy and Compliance	12/14/95	A5
	U.S. Environmental Protection Agency, Region IX (Wetlands and Sediment Management)	12/21/95	A6
	U.S. Environmental Protection Agency, Region IX (Office of Federal Activities)	1/18/96	A7
B. State Agencies	Delta Protection Commission	9/15/95	B1
	California Department of Boating and Waterways	9/19/95	B2
	Northwest Information Center of the Historical Resources Information System	11/1/95	B3
	California Department of Water Resources	11/9/95	B4
	California State Lands Commission	11/21/95	B5
	California Department of Fish and Game	12/20/95	B6
	California Department of Water Resources	12/21/95	B7
	California Department of Transportation	12/21/95	B8
	California Resources Agency	12/21/95	B9
C. Local and Regional Agencies	Metropolitan Water District of Southern California	11/3/95	C1
	San Joaquin County Community Development Department	11/14/95	C2
	Shasta County Board of Supervisors	11/27/95	C3
	San Joaquin Tributaries Association	12/6/95	C4
	East Bay Regional Park District	12/12/95	C5

Table 3-1. Continued

Category	Commenter	Date	Letter #
	East Bay Municipal Utility District	12/14/95	C6
	Bradford Reclamation District No. 2059	12/14/95	C7
	Sacramento County Water Resources Division	12/20/95	C8
	Contra Costa Water District	12/20/95	C9
	San Joaquin County Department of Public Works	12/20/95	C10
	San Joaquin County Community Development Department	12/20/95	C11
	San Joaquin County Council of Governments	12/21/95	C12
	Contra Costa County Community Development Department	12/21/95	C13
	Metropolitan Water District of Southern California	12/21/95	C14
	Ironhouse Sanitary District	12/21/95	C15
	Reclamation District No. 830	12/21/95	C16
	Central Delta Water Agency et al. (Nomellini, Grilli & McDaniel)	12/21/95	C17
D. Special Interest Groups	Planning and Conservation League	10/4/95	D1
	California Sportfishing Protection Alliance	10/11/95	D2
	Shasta Lake Business Owners' Association	10/11/95	D3
	California Striped Bass Association	10/15/95	D4
	Central Valley Habitat Joint Venture	10/30/95	D5
	California Urban Water Agencies	11/1/95	D6
	California Waterfowl Association	11/20/95	D7
	Friends of the River	11/27/95	D8
	California Sportfishing Protection Alliance	12/13/95	D9
	California Native Plant Society	12/19/95	D10
	Natural Heritage Institute	12/20/95	D11
	The Bay Institute of San Francisco	12/21/95	D12
	Marin Audubon Society	12/21/95	D13
	California Urban Water Agencies	12/21/95	D14

Table 3-1. Continued

Category	Commenter	Date	Letter #
E. Individuals and Other Interested Parties	Rob Fletcher	10/18/95	E1
	George C. “Tim” Wilson	10/20/95	E2
	Daniel Wilson	10/20/95	E3
	Ellis M. “Steve” Stephens (Ellis Island Farms, Inc.)	10/26/95	E4
	Leisha Robertson (D&L Farms)	11/1/95	E5
	Kyser Shimasaki	11/20/95	E6
	Earl W. Cooley (Medford Island Habitat Conservation Area)	11/29/95	E7
	Paul and Liza Allen	12/10/95	E8
	Peter Margiotta	12/18/95	E9
	Robert C. and Jean M. Benson	12/18/95	E10
	California-Oregon Transmission Project	12/19/95	E11
	The Dutra Group	12/19/95	E12
	William Shelton	12/21/95	E13
	Delta Wetlands Properties (Ellison & Schneider)	12/20/95	E14
	Pacific Gas and Electric Company	12/20/95	E15
F. Public Hearing	Roger Lefebvre (Shasta Lake Business Owners’ Association)	10/11/95	F1
	Paul Allen	10/11/95	F2
	Kevin Wolfe	10/11/95	F3
	Liza Allen	10/11/95	F4

Section A. Federal Agencies

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

Reply to: 730 Simms Street, #401
Golden, Colorado 80401

October 25, 1995

Jim Monroe, P.E, Esq.
Chief, Sacramento/San Joaquin
Delta Office
Corps of Engineers
1325 J Street
Sacramento, CA 95814-2922

REF: *Draft Executive Summary for the Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project*

Dear Mr. Monroe:

On October 4, 1995, we received the Executive Summary for the draft Environmental Impact Report and Environmental Impact Statement (Summary) for the Delta Wetlands Project. The Summary (page 34-35) provides a general overview of the effects of the project on historic properties that are known to exist within the project area. Each of the Alternatives has the potential to have significant effects on historic properties, although Alternative 3 may effect more historic properties than Alternatives 1 or 2. Effects to historic properties will be cumulative as well as immediate.

The COE should consider the indirect effects of increased visitation to the area that will result from the development of recreation facilities. The COE might also consider including an historic preservation representative on the committee for the Delta Environmental Research Fund. A1-1

Thank you for providing us with the opportunity to review and comment on this document. If you have questions concerning our comments, please do not hesitate to contact Catherine Cameron of our staff at (303) 231-5320.

Sincerely,

Claudia Nissley
Director, Western Office
of Review

Advisory Council on Historic Preservation

A1-1. The indirect effects on cultural resources from recreational use of the Delta Wetlands Project islands were addressed in Chapter 3M, "Cultural Resources", of the 1995 DEIR/EIS; see Chapter 3M in Volume 1 of this FEIS. The potential for increased vandalism and disturbance of archaeological resources caused by recreational use of the islands is identified under Impacts M-1, M-3, and M-6 for Alternatives 1 and 2, and under Impacts M-7, M-8, M-9, M-10, and M-12 for Alternative 3.

The committee for the environmental research fund described on page 2-9 of the 1995 DEIR/EIS (page 2-11 in FEIS Volume 1) would be administered by Delta Wetlands; an invited committee would be established to decide how the research funds would be allocated. Delta Wetlands has the discretion to appoint a historic preservation representative to the committee for the Delta Wetlands environmental research fund.

Letter A2

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213
TEL (310) 980-4000; FAX (310) 980-4018

F/SW03:GRS

OCT 26 1995

Mr. Jim Monroe
Chief, Sacramento/San Joaquin Delta Offices
Department of the Army
U. S. Army Engineer District, Sacramento
Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Dear Mr. Monroe:

Thank you for providing the National Marine Fisheries Service (NMFS) with the opportunity to comment on the Biological Assessment (BA) entitled: "Impacts of the Delta Wetlands Project on Fish Species."

General Comments on the Project Description

The Delta Wetlands (DW) project description outlines a wide range of project flexibility from providing DW discharge for export at the State Water Project (SWP) and Central Valley Project (CVP) to providing DW discharge for Delta outflow. Phrases such as "DW could choose", or "uncertain at times", or "most likely", or "may be sold or used" are used frequently in the BA's description of project operations. Specific operations in any particular water year are vague. Potential effects to the endangered Sacramento River winter-run chinook salmon could also range widely from beneficial to adverse depending on project operations and the destination of DW discharges. A2-1

The BA describes the DW project as designed to operate within the objectives of the State Water Resources Control Board (SWRCB) 1995 Water Quality Control Plan (WQCP) developed for the SWP and CVP. However, project alternative 1 requires a modification to the total delta inflow formula and project alternative 2 requires an exemption from the WQCP "percent inflow" export limit. The 1995 WQCP was developed to address the permits and licenses of the Bureau of Reclamation (Bureau) and the California Department of Water Resources (DWR) to appropriate water. Since the DW project falls outside the scope of the existing water right and the normal coordinated operation of the CVP and SWP, the SWRCB may choose to set additional or alternative terms and conditions upon diversions and discharges by the DW project. A2-2

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Although the SWP and CVP export facilities are described as integral components of the DW project, the Bureau and DWR have not participated in the development of the project proposal or committed to the purchase of DW discharges. Thus, incorporation of DW project operations into SWP/CVP operations is unclear and uncertain at present. NMFS will require more specific information regarding CVP and SWP operations from the Bureau and DWR to fully assess the potential effects of DW project water that is sold or "wheeled" through the existing Delta export facilities. A2-3

General Comments on the Impact Assessment for Winter-run Chinook

The BA relies on the use of a mortality index to evaluate the potential effects of Delta flow diversions and patterns on survival of juvenile winter-run chinook salmon during migration through the Delta. In the "Impacts Assessment" section of the BA, mortality values are presented several times without being referred to as indices. It is important to note that the values generated by the Jones & Stokes model are not predictive of actual levels of mortality and that these indices are valid for comparison purposes only. A2-4

In addition, the mortality indices generated by the Jones & Stokes model may significantly underestimate the level of mortality for several reasons:

1) The model assumes that juvenile salmon that continue down the Sacramento River below Georgiana Slough are not affected by DW or SWP/CVP operations. Fisheries investigations by the U.S. Fish and Wildlife Service have shown that juvenile salmon released in the Sacramento River at Ryde and in the lower San Joaquin River at Jersey Point are effected by SWP/CVP export operations. Therefore, the population at risk is likely to exceed the levels evaluated in the model because the geographic area of influence is broader than the area identified in the model. A2-5

2) The mortality model assumes all juvenile salmon are actively migrating through the Delta to the sea without regard to their time of arrival. By doing so, the model does not address the cumulative effects on rearing juvenile salmon. Juvenile winter-run chinook salmon which arrive in the Delta during the fall and early winter months are likely to reside in Delta waterways for several months. These fish will be subject to any and all adverse conditions created by DW operations until they undergo smoltification and emigration from the Delta during the early spring. The model may significantly underestimate mortality rates by assuming all fish in the area of risk have been entrained or emigrated after 10 days. A2-6

3) The Jones & Stokes model assumes the Delta Cross Channel gates are closed continuously from November 1 through late May. A2-7

The 1995 WQCP provides for a total of 45 days of gate closure between November 1 and January 31. Thus, the number of fish which are diverted off the Sacramento River into the central Delta and subsequently lost due to project operations will be greater than estimated in the BA. A2-7 cont'd

4) The DeltaSOS model simulates monthly DW operations and Delta hydrological conditions. However, daily conditions can vary widely from the monthly averages generated by the model. Juvenile chinook salmon will be responding to the daily and, even, hourly hydrological conditions in Delta. Large losses of fish may occur during brief periods of adverse hydrological conditions. A2-8

Specific Comments

Page 1-3, Delta Export Demands, 2nd paragraph. At this time, the buyers or potential uses of the DW water are unknown, making the project description incomplete and analysis of the project effects difficult. A2-9

Page 1-3, Delta Water Quality Needs, 1st paragraph. Although the BA indicates the DW project could increase the supply of high-quality water for environmental benefits including Delta outflow, this type of operational scenario is not described in project Alternatives 1 or 2. A2-10

Page 2-6, Habitat Island Diversions and Discharges. It is unclear if habitat island water diversions and discharges are designed to operate within the 1995 WQCP or any other operational criteria. A2-11

Page 5-16, Cumulative Impacts, 2nd paragraph. Pursuant to the February 12, 1993, biological opinion issued by NMFS for winter-run chinook salmon, the Bureau maintains suitable habitat conditions (e.g. temperatures and flow) in the upper Sacramento River and a minimum carryover storage level in Shasta Reservoir. Thus, upstream conditions in the Sacramento River are likely to improve, rather than deteriorate, in future years for winter-run chinook salmon. A2-12

Page 5-16, Cumulative Impacts, 4th paragraph. The DW project could also result in reservoir water stored for a reduced period of time. Reservoir releases may increase earlier in the season, because DW water would be available for use later in the year. Reduced reservoir levels over the summer and fall months could result in adverse temperature conditions for spawning salmon and steelhead trout. A2-13

Page 5-16, Summary of Potential Fishery Effects of the DW Project, Beneficial Effects, Foregone agricultural diversions. There is little overlap between the timing of the juvenile A2-14

winter-run chinook salmon outmigration and the irrigation season for Delta agriculture. Thus, there would be little benefit for winter-run chinook salmon associated with the elimination of these diversions. A2-14 cont'd

Summary

The information provided in the BA is inadequate for the completion of formal section 7 consultation with NMFS for the endangered winter-run chinook salmon. However, meetings between my staff, Jones & Stokes, and the DW project have provided a significant amount of new information which should facilitate the successful completion of consultation. NMFS will continue to work with the DW project and their consultants to clarify the project description and further assessment of potential project effects on the endangered winter-run chinook salmon. A2-15

If you have any questions about these comments please call Ms. Penny Ruvelas at (707) 578-7513.

Sincerely,

for JJ Slawson

Hilda Diaz-Soltero
Regional Director

cc: Robert Pine, USFWS
Debra McKee, CDFG
Dale Sweetnam, CDFG
Ken Bogdan, Jones and Stokes Associates

National Marine Fisheries Service

This letter comments on the biological assessment that addresses Delta Wetlands Project effects on fish species (Appendix F2 of the 1995 DEIR/EIS) and that was submitted to NMFS and USFWS in accordance with the requirements of Section 7 of the federal ESA.

A2-1. Since this comment letter was submitted, USACE has concluded formal consultation with USFWS and NMFS on project effects on listed fish species. As part of the consultation process for compliance with both the federal and California ESAs, USACE, the SWRCB, NMFS, USFWS, DFG, and Delta Wetlands agreed on the project operating parameters referred to as the FOC. The FOC, which have been incorporated into the proposed project, more closely define the operations of the proposed project.

NMFS subsequently issued no-jeopardy biological opinions regarding project effects on winter-run chinook salmon, Central Valley steelhead ESU, and Central Valley spring-run chinook salmon ESU. USFWS issued no-jeopardy biological opinions regarding project effects on delta smelt and splittail. DFG issued a no-jeopardy biological opinion regarding project effects on delta smelt and winter-run chinook salmon. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for details about the formal consultation and discussion of the biological opinion terms.

See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program", regarding coordination of project operations with the SWP and CVP.

A2-2. As noted by the commenter, the Delta Wetlands Project—and any other in-Delta storage project—falls outside the scope of the existing water rights and the normal coordinated operations of the SWP and CVP. The project is designed and expected to operate within the objectives described in the 1995 WQCP. In-Delta storage was not anticipated as part of SWP and CVP operations, however; as a result, the 1995 WQCP does not address how discharges from in-Delta storage would be factored into the calculations of inflow in the export/inflow (E/I) ratio. The commenter is correct in stating that if the SWRCB were to approve Delta Wetlands' water right applications, it would specify in the project permits the terms and conditions under which Delta Wetlands would be allowed to operate.

The biological opinions issued for the Delta Wetlands Project by DFG, NMFS, and USFWS include some direction for interpretation of Delta Wetlands Project operations in the context of the 19995 WQCP E/I ratio. As stated in the USFWS biological opinion:

> For the purposes of this biological opinion, discharges from the [Delta Wetlands] project are not counted as inflow to the Delta, as defined by the 1995 WQCP. Treatment of [Delta Wetlands] discharges as Delta inflow will constitute new information and may require further consultation.

The NMFS biological opinion includes similar language. Additionally, as stated in the NMFS biological opinion, the federal biological opinions are based on the assumption that:

> [Delta Wetlands] discharge for export at the CVP/SWP would be regulated in a manner that the CVP/SWP export limits, as defined by the WQCP, are not exceeded.

A2-3. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

A2-4. As the commenter notes, the mortality values presented in the impact assessment are indices; these values are not predictive of actual mortality levels and are valid for comparison purposes only. Although the biological assessment discussion in some places failed to note that the mortality values are indices, this oversight was corrected in Chapter 3F of the 1995 DEIR/EIS. The mortality index is introduced as follows on page 3F-11 of the 1995 DEIR/EIS (page 3F-12 in FEIS Volume 1):

> The mortality index should not be construed as the actual level of mortality that would occur because simulated monthly conditions cannot accurately characterize the complex conditions and variable time periods that affect survival during migration through the Delta. The mortality index provides a basis for comparing the effects of alternative Delta Wetlands operations on chinook salmon that could result from changes in diversions and Delta flows.

The discussions of impacts in the chapter correctly refer to the mortality values as indices.

A2-5. The mortality model used for the biological assessment and 1995 DEIR/EIS impact assessment, which was modified from a USFWS model (Kjelson et al. 1989), assumes that juvenile salmon that continue down the Sacramento River below Georgiana Slough are not affected by SWP/CVP export operations and would not be affected by Delta Wetlands operations. This assumption is consistent with the models developed by USFWS and used by EPA and other agencies; these models do not assume that export operations would affect juveniles moving down the Sacramento River (see page 3F-11 of the 1995 DEIR/EIS [FEIS page 3F-12] under "Methods for Assessing Effects on Chinook Salmon"). USFWS studies show that some tagged juveniles released at Ryde and Jersey Point have ended up at the export facilities; however, it cannot be concluded from these observations that juveniles migrating down the lower Sacramento River would be affected by export operations, and as noted above, such a conclusion is not consistent with the USFWS modeling assumptions.

The NMFS biological opinion, issued in 1997, addresses potential project effects on juvenile chinook salmon; see Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

A2-6. Salvage records and Chipps Island surveys indicate that fish are most susceptible to entrainment in exports during the smolt life stage because smolts are actively moving. From these data, it is inferred that Delta Wetlands diversions would affect rearing juveniles less than they would affect smolts. The distribution used for the analysis is an adequate approximation of vulnerability. As described in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", the NMFS, USFWS, and DFG biological opinions address potential project effects on fish entrainment.

A2-7. The commenter is correct in noting that the modeling used to assess impacts on winter-run salmon simulates continuous closure of the DCC gates during November through January, while the 1995 WQCP provides for a total of 45 days of DCC gate closure between November 1 and January 31. As noted in the impact assessment in Chapter 3F, the volume of flows in the DCC and Georgiana Slough would be the same under the Delta Wetlands Project as under the No-Project Alternative because CVP/SWP exports and Delta Wetlands diversions would not change the DCC and Georgiana Slough flows; therefore, any error in the modeling of DCC operations would apply both to simulations of the No-Project Alternative and to those of project operations. This difference is considered to have little, if any, effect on the outcome of the impact assessment. Furthermore, winter-run chinook salmon are most vulnerable during February and March. The NMFS biological opinion addresses potential project effects on juvenile chinook salmon; see Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

A2-8. Monthly simulations of operations (using DWR's model DWRSIM and USBR's model PROSIM) are currently the best available tools for estimating Delta inflows and upstream operations. The monthly operations model Delta Standards and Operations Simulation (DeltaSOS) uses the initial water budget developed from the results of simulations performed by DWR using DWRSIM. The impact assessment performed for the 1995 DEIR/EIS (and biological assessment) using the monthly operations model DeltaSOS is therefore consistent with the currently available assessment models and with current practices.

Both the 1995 DEIR/EIS (see Appendix A4) and the 2000 REIR/EIS (see Appendix F) include discussions of the potential daily Delta Wetlands operations that would be modified as daily Delta flows and salinity conditions change. Appendix F of the 2000 REIR/EIS indicates how the requirements identified in the FOC for the project would limit daily operations. Measures to protect fish include FOC terms that specify several periods of delay for the beginning of Delta Wetlands diversions and reductions in Delta Wetlands operations when the FMWT index is less than 239. The FOC also include provisions to reduce Delta Wetlands pumping or diversions if protected fish are observed in the required daily fish monitoring. The FOC terms are expected to protect fish from Delta Wetlands Project impacts under all possible conditions for daily Delta flows, salinity, and fish abundance. The RPMs in the state and federal biological opinions add further protections and compensation for incidental take of protected species.

The commenter states that "large losses of fish may occur during brief periods of adverse hydrological conditions". If "large" refers to a high percentage of the population, large losses of chinook salmon during brief periods would occur only when a large percentage of the chinook salmon population enters the Delta in a short period. Although such large, sudden influxes are observed for some species (e.g., striped bass eggs and larvae), available data indicate that this is not the case for chinook salmon.

A2-9. The specific beneficial uses and areas of end use of Delta Wetlands water are unknown. The identities of the end users of Delta Wetlands water remain speculative because of the diverse interests and competing demands for water for municipal, agricultural, and environmental needs. Therefore, the 1995 DEIR/EIS and 2000 REIR/EIS analyses were performed based on the assumption that it would be too speculative to attempt to identify buyers of the water or specify the locations within the CVP and SWP service areas where the water would be put to beneficial use. As noted in response to Comment A2-7, the FOC terms are expected to protect fish from Delta Wetlands Project impacts under all possible conditions for daily Delta flows, salinity, and fish abundance. See also Master Response 3, "Areas of End Use and Potential Growth-Inducement Effects on Delta Wetlands Water Deliveries".

A2-10. See Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow", for discussion regarding the use of Delta Wetlands discharges to provide water for outflow.

A2-11. Under the proposed project, Delta Wetlands would divert water onto the habitat islands to provide water necessary to implement the HMP. Diversions and discharges of water to and from the habitat islands would not differ substantially from existing agricultural practices, and diversions to the habitat islands would be performed under Delta Wetlands' existing riparian and appropriative water rights. The FOC terms prohibit Delta Wetlands from discharging water for export from the habitat islands. For these reasons, the 1995 WQCP operational criteria for the CVP and SWP would not apply to habitat island operations.

A2-12. The biological opinion issued by NMFS for effects of CVP operations on winter-run salmon ensures that existing conditions will be maintained, not that they will be improved. Although USBR will maintain the minimum level of Shasta Reservoir carryover storage specified in the biological opinion, average carryover storage is likely to decline in the future because of increased demands.

A2-13. Delta Wetlands Project operations would not affect upstream reservoir releases. The project would need to be integrated with SWP and CVP operations for changes in such releases to occur. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program". It should be noted that minimum streamflows below the CVP and SWP upstream reservoirs are regulated by existing instream flow requirements, and streamflows could not be reduced below these minimums. Therefore, if the SWP or CVP purchases

Delta Wetlands water as a replacement for upstream reservoir releases, the SWP and CVP would still need to meet these instream flow requirements.

A2-14. The commenter is correct in stating that the benefit to chinook salmon from forgone agricultural diversions is probably small. Under current practices, however, there are winter agricultural diversions that correspond with the period of juvenile winter-run migration; therefore, discontinuing agricultural diversions onto the Delta Wetlands islands would benefit chinook salmon to some extent.

A2-15. NMFS completed formal Section 7 consultation for the winter-run chinook salmon and issued a no-jeopardy biological opinion for the Delta Wetlands project in May 1997. A copy of the final biological opinion was provided in Appendix D of the 2000 REIR/EIS.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30341-3724

Letter A3

November 20, 1995

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1325 J Street, Room 1444
Sacramento, California 95814-2922

Dear Mr. Monroe:

We have completed our review of the Draft Environmental Impact Statement (DEIS) for the Delta Wetlands Project. We are responding on behalf of the U.S. Public Health Service.

We believe potential impacts on human health have been generally addressed, however, we do offer several comments for your consideration in preparing the final EIS. We were pleased to see the discussions on potential mosquito impacts and public health in this draft document

We noted that necessary residential displacements " will be compensated," however, our review did not reveal mention of the Uniform Relocation Assistance and Real Property Acquisition Act, or if adequate replacement housing was immediately available to affected households. **A3-1**

Our review did not reveal a preferred alternative. In the Executive Summary, it is stated several times that "if the project description were modified to reduce the number of recreational facilities built on the DW project islands, the impacts could be reduced to a less-than-significant level". The Final EIS should clarify what level of construction is intended when a preferred alternative is identified in the FEIS. **A3-2**

It is stated in "Impact E-11" that "as part of the recreational facility design, DW will install a new sewage disposal system at each facility consistent with San Joaquin County and Contra Costa County Requirements for sewage disposal systems and designs. Therefore, this impact is considered less than significant." There are no assurances given, however, that requested permits will be issued. It is stated that the disposal system planned will be individual septic systems. To receive permits for these systems, the available land must be suitable for the soil absorption drainage fields. Will soil percolation rates in the Delta region support an adequate septic system? Depending on the pending permits, alternative sewage treatment methods or a reduction in new facilities will need to be addressed. **A3-3**

We noted a brief discussion on page 3C-23 regarding hazardous sites. It is stated that "the DW project islands contain several sites of potential soil contamination caused by historical agricultural operations or waste disposal." However a summary of specific waste site characterization data or related provisions to mitigate potential public health impacts was lacking in this section and in the public health section. It would be helpful to note the status of any hazardous wastes sites in the project area, any potential for public health impacts, and any planned mitigation measures to ensure the public's health and safety from any potential exposures. **A3-4**

Thank you for the opportunity to review and comment on this draft document. Please ensure that we are included on your mailing list to receive a copy of the Final EIS, and future EIS's which may indicate potential public health impact and are developed under the National Environmental Policy Act (NEPA).

Sincerely yours,

Kenneth W. Holt

Kenneth W. Holt, M.S.E.H.
Special Programs Group (F29)
National Center for Environmental Health

cc: Jim Sutton, State WRCB

Department of Health and Human Services

A3-1. The California Relocation Assistance and Real Property Acquisition Guidelines are designed to carry out the policies of the Uniform Relocation Assistance and Real Property Acquisition Act. One of the stated purposes of the guidelines is "to ensure that uniform, fair, and equitable treatment is afforded persons displaced from their homes, businesses or farms as a result of the actions of a public entity in order that such persons shall not suffer disproportionate injury" (Article 1, Section 6002). The guidelines require that an agency determine whether comparable replacement dwellings will be available before the displacement occurs.

Chapter 3I, "Land Use and Agriculture", identifies the displacement of residences and structures on the Delta Wetlands Project islands that would occur with project implementation and notes the availability of comparable housing in the area. At this time, Delta Wetlands owns all property that would be affected by the proposed project (Alternative 1 or 2). Acquisition of real property would not be needed to implement the proposed project. Chapter 3I identifies the need to relocate 20 residences and six farm worker barracks on Bacon Island and three trailers and one residence on Webb Tract. Comparable or higher quality housing opportunities are immediately available in the local area (Contra Costa and San Joaquin Counties) for those tenants who would need to relocate. The tenants on the Delta Wetlands Project islands are aware of the proposed project and have been kept informed throughout the NEPA/CEQA process (for example, see comment letters E5 and E6). Delta Wetlands would give tenants no less than 6 months after the project is approved to find new housing.

A3-2. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

See the Summary chapter in Volume 1 of this FEIS for a discussion of the preferred alternative. The USACE's record of decision also will discuss the preferred alternative as required by NEPA.

A3-3. Recreation facilities for the Delta Wetlands Project would not be built without proper septic system permits or any other permit deemed necessary by Contra Costa County or San Joaquin County. Currently, the existing septic systems serve farmsteads, rural residences, and other structures on the project islands as described in Chapter 3E, "Utilities and Highways"; these systems consist of individual septic tanks that each contain leach lines buried 34–36 inches underground (Huggins pers. comm.).

The governing counties have been contacted regarding the requirements for issuing permits for new facilities. Based on those discussions, more information has been added to Mitigation Measure E-7. Additionally, several marinas in both San Joaquin and Contra Costa Counties were contacted to determine how they dispose of sewage in the Delta area; use of septic tank systems was found to be a common method of sewage disposal. Whatever sewage treatment method is proposed at the recreation facilities, the project

proponent will need to coordinate with the county environmental health department, assess the suitability of that system for the site-specific soil conditions, and construct the new facilities only if permits are approved by the regulating county department. If, when specific design details are submitted, a regulating agency determines that the NEPA and CEQA documentation already completed for the project does not cover site-specific environmental impacts in enough detail, the agency may require additional environmental documentation before approving permits, entitlements, or alternative treatment methods.

The following information has been added to Mitigation Measure E-7:

> In order to obtain a sewage permit in San Joaquin County, Delta Wetlands would be required to submit an application along with a work plan for the recreation facilities to the San Joaquin County Environmental Health Department. The work plan would then be reviewed by the Environmental Health Department to ensure compliance with all county requirements, and a permit would be issued or denied based on the findings of the review (Borgman pers. comm.).
>
> Contra Costa County Environmental Health Division issues sewage permits in Contra Costa County. As with San Joaquin County, Delta Wetlands would be required to submit an application. In addition, Delta Wetlands would be required to submit three sets of plans for the recreation facilities along with a site map depicting existing structures and resources on the islands, and a safety plan. Issuance of the permit would be based upon compliance with all county requirements, review of the application, and site visit information obtained by the health inspector (Fung pers. comm.).
>
> If, when specific design details are submitted to the appropriate regulating agencies, the agency determines that site-specific environmental impacts are not covered in enough detail by NEPA and CEQA documentation already completed for the DW project. Additional environmental documentation may be required prior to approval of permits, entitlements, or alternative treatment methods.

The following citations have been added to Chapter 3E:

Borgman, Carl. Supervising registered environmental health specialist. San Joaquin Environmental Health Department, Stockton, CA. February 27, 1996—telephone conversation.

Fung, Eric. Health inspector. Contra Costa County Environmental Health Division, Martinez, CA. March 11, 1996—telephone conversation; March 12, 1996— information on sewage permit applications sent by mail.

The lead agencies have analyzed the effects of the Delta Wetlands Project. Through discussions with the appropriate counties, which are responsible agencies in the CEQA process, they have determined that no additional mitigation was found to be necessary if the existing permit requirements for the counties are met. With implementation of Mitigation Measure E-7, the impact of increase in demand for sewage disposal services from implementation of the Delta Wetlands Project would be reduced to a less-than-significant level. Approval of the Delta Wetlands Project would be conditioned on the construction of the recreation facilities, specifically on implementation of Mitigation Measure E-7; if Mitigation Measure E-7 were not implemented, the recreation facilities would not be built and the impact would not occur.

As described in Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities", construction of the recreation facilities has been removed from Delta Wetlands' CWA and Rivers and Harbors Act permit applications; therefore, USACE will not approve construction of such facilities when it issues its record of decision. See Master Response 5 for more information.

A3-4. Appendix C-6 of the 1995 DEIR/EIS presents a detailed analysis of the pesticide residues that may be present in the Delta Wetlands Project island soils. It was determined that the soils do not contain significant concentrations of agricultural chemicals and that past agricultural practices should not affect the quality of water stored on the Delta Wetlands Project islands. However, as discussed on page 3C-23 of the 1995 DEIR/EIS) page 3C=2.5 in FEIS Volume 1), because of the past agricultural activities on the Delta Wetlands Project islands, there is a potential that several sites of soil contamination from agricultural pesticides and other associated pollutants may exist. Although no known sites have been identified on the islands, the 1995 DEIR/EIS considered the potential contamination of water stored on the islands to be a concern warranting a "worst-case" approach; therefore, the 1995 DEIR/EIS concluded that the potential contamination of stored water by pollutant residues was a significant impact, and it indicated that implementation of Mitigation Measure C-8 would ensure that there are not sites on the Delta Wetlands Project islands that could contaminate stored water. Figure 3C-8 presents those sites considered to have the potential to contain contaminant soils on the Delta Wetlands Project islands.

Letter A4

UNITED STATES DEPARTMENT OF COMMERCE
Office of the Under Secretary for
Oceans and Atmosphere
Washington, D.C. 20230

November 27, 1995

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

Dear Mr. Sutton:

Enclosed are comments on the Draft Environmental Impact Statement for Delta Wetlands Project in Contra Costa and San Joaquin Counties, California. We hope our comments will assist you. Thank you for giving us an opportunity to review the document.

Sincerely,

Donna S. Wieting
Acting Director
Ecology and Conservation Office

Enclosure

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

COMMENTS ON

DRAFT ENVIRONMENTAL IMPACT STATEMENT

FOR

DELTA WETLANDS PROJECT IN CONTRA COSTA AND

SAN JOAQUIN COUNTIES, CALIFORNIA

General Comments

Project Description

The DW project description currently describes a wide range of project flexibility, including the use of the proposed reservoir islands to store banked or transferred water. However, the EIR/EIS does not adequately address the potential effects of these types of operations due to the uncertain participation of the State Water Project (SWP) and the Central Valley Project (CVP). In fact, the CVP and SWP are integral components of all DW operations, but they have not participated in the development of the project proposal or committed to the purchase of DW discharges. Uncertain operational scenarios such as transferring or banking water should not be included in the DW project description until more certainty and specific information is available. **A4-1**

The EIR/EIS describes the DW project as designed to operate within the objectives of the State Water Resources Control Board (SWRCB) 1995 Water Quality Control Plan (WQCP) which was developed for the SWP and CVP. However, project alternative 1 requires a modification to the total delta inflow formula, and project alternative 2 requires an exemption from the WQCP "percent inflow" export limit. The 1995 WQCP was developed to address the permits and licenses of the Bureau of Reclamation (Bureau) and the California Department of Water Resources (DWR) to appropriate water. Since the DW project falls outside the scope of the existing water right and the normal coordinated operation of the CVP and SWP, the SWRCB may choose to set additional or alternative terms and conditions upon diversions and discharges by the DW project. **A4-2**

Fisheries Impacts

The DW project proposes to include the discharges from their reservoir islands as a part of the inflow volume used to calculate the water available for export under the 1995 WQCP export/inflow ratios. Including the discharges from the DW project islands as a part of the inflow into the Delta is not appropriate because of the source of the water. The water discharged from the DW project reservoir islands would not have **A4-3**

the same biological benefits as the water flowing down the Sacramento or San Joaquin Rivers and into the Delta. Water flowing down these rivers may have temperature, transportation, and biological cue benefits to anadromous fishes that water originating from within the Delta would not. DW project water should be considered a second source or input of water into the Delta and be treated accordingly under terms and conditions set by the SWRCB. **A4-3 cont'd**

Habitat Islands

The DW project proposal includes the use of two reservoir islands as "habitat islands" managed for the enhancement of terrestrial species habitat, including seasonal waterfowl habitat. DW proposes to maintain seasonal levels of shallow water on these islands and may choose to sell the discharged habitat island water for export. It is unclear if habitat island water diversions and discharges are designed to operate within the 1995 WQCP or any other operational criteria. **A4-4**

Levee Maintenance

The draft EIR/EIS states that the levees on all four project islands will be maintained to protect the habitats or reservoir storage within. However, the impact analysis fails to assess the initial and cumulative effects of herbicide applications, and the increased or continued predator habitat created by the rock rip-rap levees. Juvenile salmonids have shown a comparatively low level of utilization of areas with rip-rapped banks due to limited in-water cover provided by the rock (CDFG 1982). Revegetation of these levees with riparian or other overhanging riverine vegetation could enhance the available fisheries habitat rather than continue to degrade it. **A4-5**

Recreation Facilities

The proposed recreation facilities on the DW project islands could adversely modify or destroy existing shallow vegetated habitat that is essential to the resident and anadromous fishes of the Delta. Additionally, the docks and pilings may increase predator habitat and result in the loss of juvenile salmon. Increased boat traffic also has the potential to adversely affect sensitive species through oil or gas spills and increased turbidity from boat propellers or wakes. Appropriate mitigation must be developed which will address these impacts. **A4-6**

Cumulative Impacts: Future Developments

The EIR/EIS does not provide an adequate analysis of cumulative fisheries impacts. Less than one year has passed since the December 1994 Bay-Delta framework agreement was reached in which new delta outflow and salinity standards were established in an effort to halt the decline of salmon, delta smelt, and other fish populations. When these standards were developed, models were used to predict typical outflow patterns that would occur during different water year types. It was believed that in addition to new higher minimum flow and salinity standards, modelled "excess" flows above the minimum standards would be a critical factor in allowing the recovery of fish populations.

It is unknown whether the protective standards contained in the Bay-Delta agreement will be sufficient to protect fisheries resources. The DW project would reduce so-called "excess" delta outflows and delta transport flows at various times of the year during different water years. If the existing "excess" flow regime is not adequate to protect fisheries resources, additional reductions in flow associated with the DW project will exacerbate the problem. Conversely, if the existing "excess" flow regime is adequate to protect fisheries resources, additional reductions in flow may render them inadequate. **A4-7**

To properly address the cumulative impacts of the DW project on fisheries resources, the EIS\EIR needs to provide analysis demonstrating that: 1) existing "excess flows" under the Bay-Delta agreement are more than adequate to allow the recovery of fisheries resources, and 2) "excess" flows remaining after cumulative flow reductions from the DW project, the Interim South Delta Project, and other planned delta water projects would still allow the recovery of fisheries.

Summary

The project description of the DW project included in this draft EIR/EIS requires clarification on several issues. Certain types of operations such as transferring or banking water are referred to vaguely and could have a wide range of impacts to aquatic resources. Also, the CVP and the SWP are key components of the project proposed by DW and yet the Bureau and DWR have not committed to buying or wheeling the water stored by the DW project. The EIS\EIR would benefit from further information regarding the use of DW discharges at the CVP and SWP facilities. **A4-8**

National Oceanic and Atmospheric Administration

A4-1. See Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow", and Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

A4-2. See response to Comment A2-2.

A4-3. The commenter is correct in noting that Delta Wetlands discharges would not have the same biological benefits as water flowing down the Sacramento or San Joaquin River. As described in the 1995 DEIR/EIS and the 2000 REIR/EIS, Delta Wetlands Project operations would not affect compliance with the minimum-outflow objectives in the 1995 WQCP, and they would not affect inflow from the San Joaquin, Sacramento, or Mokelumne Rivers. Therefore, Delta Wetlands discharges are not assumed to replace existing Delta inflows.

It should be noted that the objectives for export limits included in the 1995 WQCP are intended specifically "to protect the habitat of estuarine-dependent species by reducing the entrainment of various life stages by the major export pumps in the southern Delta". The terms of the Delta Wetlands FOC, developed as a part of the California and federal ESA consultation process, consist of detailed criteria that govern operations of the proposed project to eliminate project impacts on listed fish species and their habitats; these criteria mitigate potential project effects on entrainment at the SWP/CVP pumps. The FOC terms primarily specify the allowable timing and magnitude of project diversions for storage and discharges for export or outflow. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for more information.

The FOC terms and biological opinion RPMs apply to the proposed project regardless of how in-Delta storage operations are accounted for under the 1995 WQCP export limit; incorporating these measures into the proposed project reduces the effects of project operations on fish species and their habitats to a less-than-significant level (see Chapter 3F).

A4-4. See response to Comment A2-11.

A4-5. Levee improvements and maintenance are described in Chapter 3D. Delta Wetlands' levee design for the reservoir islands includes the use of riprap on the interior levee slopes only, as described in Chapter 3D under "Erosion Protection in Levee Design"; the use of riprap is not included in planned improvements to the habitat island levees, which are also described in this section. Maintenance of the exterior (i.e., channel-side) levee slopes, including placement of riprap, under Delta Wetlands Project operations would be the same as under current practices. Project operations therefore would not increase the potential for cumulative effects of herbicide applications or for predation associated with riprap. See

also “Alteration of Habitat” in Master Response 4, “Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions”.

A4-6. The NMFS, USFWS, and DFG biological opinions fully address the potential effects of project implementation on fish species, including the effects of constructing and operating proposed recreation facilities. See “Alteration of Habitat” in Master Response 4, “Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions”, for a listing of the measures required by the biological opinions to reduce or compensate for changes in habitat that may result from the construction of recreation facilities and other project features (e.g., intake and discharge locations).

See response to Comment B7-64 regarding predation at recreation facilities.

In addition, a new mitigation measure is proposed to reduce the number of boat slips that Delta Wetlands may construct; implementation of this measure reduces the potential impacts resulting from recreation use associated with the proposed project. This measure is described under “Additional Mitigation of Potential Impacts: Reduction in Boat Slips at Recreation Facilities” in Master Response 5, “Mitigation of Environmental Effects Related to Use of Recreation Facilities”. As described in Master Response 5, Delta Wetlands has removed construction of the recreation facilities from its CWA permit application, and USACE will not approve construction of such facilities when it issues its record of decision.

A4-7. The commenter requests that the lead agencies perform an analysis to determine whether the excess flows under the Bay-Delta framework agreement are more than adequate to allow the recovery of fishery resources. The commenter further requests that the lead agencies analyze whether recovery of fishes would still be possible with the amount of excess flows remaining after the reductions resulting from operation of the Delta Wetlands Project in conjunction with other planned Delta water projects. It is not within the scope of NEPA and CEQA analysis to address whether USFWS and NMFS and other federal and state agencies set the 1995 WQCP at a level that would protect the recovery of fishery resources only with an undetermined amount of “excess flows”.

The impact analyses of the 1995 DEIR/EIS concluded that the project could result in several significant effects on water quality and fisheries; mitigation measures were recommended to reduce impacts to a less-than-significant level.

See Master Response 4, “Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions”, for a description of the operating measures developed through ESA consultation that are designed to reduce project effects on outflow and salinity for the protection of fishery resources.

A4-8. See Master Response 1, “Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow”, and Master Response 2, “Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program”.

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
600 Harrison Street, Suite 515
San Francisco, California 94107-1376

December 14, 1995

Colonel John N. Reese, District Engineer
U.S. Army Corps of Engineers, Sacramento District
Regulatory Functions Branch (Attn: Jim Monroe)
1325 J Street, Twelfth Floor
Sacramento, California 95814-2922

RE: ER 95/0693

Dear Colonel Reese:

The U.S. Department of the Interior (DOI) has reviewed the Draft Environmental Impact Statement/Report (DEIS/R) for proposed Delta Wetlands Project (Project), Delta Wetlands Properties (Bacon and Bouldin Islands and Webb and Holland Tracts), Sacramento-San Joaquin River Delta, Contra Costa and San Joaquin Counties, California.

The following comments are provided for your use and information when preparing the Final Environmental Impact Statement/Report (FEIS/R).

GENERAL COMMENTS

Fish and Wildlife Resources

The Department understands this Project would divert and store water on two islands (Webb Tract and Bacon Island). Two additional Islands, Bouldin and Holland Tract, would be managed for wetland, fish, and wildlife values to offset habitat losses resulting from the Project. These two reservoir islands encompass approximately 11,000 acres of primarily agricultural land. The mitigation islands encompass approximately 9,000 acres of agricultural land.

Proposed Project alternatives 1, 2, and 3 all would have significant adverse impacts on wildlife and fisheries, and as such, would contribute to significant cumulative impacts on the Delta's aquatic resources. A5-1

Proposed mitigation would not compensate for loss of wildlife and habitat values. Wetlands and other wildlife habitat would be adversely affected; Delta habitats directly and indirectly

impacted. These would include potential adverse effects on habitat at the Delta's X2 location.

The Fish and Wildlife Service (Service) has repeatedly indicated to Delta Properties that this project would have significant impacts on various Delta fish species, wetlands, and terrestrial wildlife species. Since the Service is currently reviewing U.S. Army Corps of Engineers' biological assessment (*Impacts of the Delta Wetlands Project on Fish Species*, June 21, 1995) and preparing a biological opinion pursuant to the Endangered Species Act of 1973, as amended (ESA), our comments are restricted to project impacts on general wildlife habitat values and non-ESA listed species.

The Service initially provided comments on the proposed project during the public notice review period (February 29, 1988). At that time, the Corps was advised of the Service's Mitigation Policy regarding project-affected wetland, aquatic, and upland habitats and of other factors that would need to be addressed in an EIS/R.

The Service further indicated it would recommend against the Corps' issuance of permits pursuant to section 404 of the Clean Water Act and section 10 of the Rivers and Harbors Act. The Service also identified the project as potentially impacting ESA listed and proposed species (April 27, 1990). **A5-1 cont'd**

Consequently, the Service commented against implementation of the project because it would impact a variety of fish and wildlife species, including the threatened delta smelt, then a candidate species for listing under the ESA.

On April 25, 1991, the Service provided recommendations to the Corps and project applicant in comments on a draft environmental document. The Service recommended against the issuance of any permit for this proposed project.

In a subsequent letter dated February 2, 1993, the Corps was advised that pursuant to Part I, paragraph 9, and part IV, paragraph 3(b) of the revised section 404(q) Memorandum of Agreement between the Department of the Army and the Department of the Interior, the proposed Delta Project (PN No. 9804) will have a substantial and unacceptable impact on aquatic resources of national importance.

In a July 31, 1995 letter (file reference 1-1-95-I-1222) commenting on the biological assessment of project impacts on delta smelt, delta smelt critical habitat, and Sacramento splittail (proposed for ESA listing as threatened), the Service provided comments on a variety of issues including the following general issues:

(1) The net effect of the project is unclear. The biological assessment discusses beneficial effects and adverse effects but does not attempt to combine these effects to obtain the net project effect;

(2) The cumulative effects of the Delta Wetlands project with other future non-federal projects are not discussed in the biological assessment. Non-federal projects such as future agricultural and urban diversions within the Delta, dredging, and other sources of contaminants may combine with the components of the Project to affect the environmental baseline; A5-1 cont'd

(3) The Project would not be able to divert any required flows provided to transport fish through the Delta to Suisun Bay. An example of such a transport flow would be the flows resulting from the lack of diversions by Los Vaqueros Reservoir; and

(4) The 1995 sampling of delta smelt indicates very low population. Thus, the analysis of project effects on delta smelt must be accurate.

Water and Power Resources

Maintenance of the levee should include a program to control wood vegetation whose root system could cause leakage of the levee. Muskrat burrows can also be a problem for levee systems, and they may need to be controlled if muskrats invade the wetlands. A5-2

Rapid flushing of the wetland system by raising and lowering water levels could remove valuable nutrients from the system. It also could affect aquatic invertebrate populations which are valuable food items for nesting waterbirds and their broods. A5-3

SPECIFIC COMMENTS

Chapter 3F. Affected Environment and Environmental Consequences -

Fishery Resources

Previous sections of the document (see Chapter 2 EIS/R, Project Description and Purpose and Need) used phrases such as the "Delta Wetlands Project could choose" or "most likely...water diversions... would begin", or "water released...may be sold or used". Statements such as these make it difficult to analyze project effects on fishery resources because of the uncertainty with how the project will normally operate in any given year. Diversions and discharges of stored water could occur during any month only subject to export limits specified in the 1995 Water Quality Control Plan. A5-4

Discharges of water from the reservoir islands with elevated temperatures (see Chapter 3C, EIS/R) could have a significant effect on juvenile chinook salmon. San Joaquin River and Mokelumne River salmon runs would be especially vulnerable to elevated temperatures, particularly if the Delta Wetlands Project were to release water with elevated temperatures to the State Water Project (SWP) prior to the end of July in any given year. While this impact is noted in the EIS/R, when combined with the Delta Wetlands Project's uncertain project description, the Service considers the potential impacts to chinook salmon juveniles as significant. A5-5

The effects of the Delta Wetlands Project on the federally listed as candidate longfin smelt generally seem to be understated. All of the alternatives and mitigation presented would result in an increase in adult and juvenile mortality above the current baseline condition. Specific mitigation should be developed which would provide direct benefit to the longfin smelt and improve the Delta baseline condition for the species. A5-6

The Service disagrees that effects of construction activities and alteration of aquatic habitat would be less than significant. The continued placement of rip-rap along levees within the Delta has resulted in significant losses of shallow vegetated aquatic habitat. There is no current program, including the SB-34 program, which has been able to create or restore significant amounts of near-shore shallow water habitat. In general, restoration efforts have resulted in development of riparian habitat interior to the levees, or a narrow strip of riparian habitat located between the levee and the existing aquatic habitat. A5-7

Development of the Delta wetland project may preclude restoration of habitat within the western Delta. Benefits accrued within the western Delta as habitat is restored and occupied by native fishes, is likely to be negated as any increased production would be subject to operations and impacts associated with the Delta Wetlands Project.

Chapter 3H. Affected Environment and Environmental Consequences - Wildlife

In general the Service agrees with the assessment of impacts and proposed mitigation measures to offset habitat losses associated with the deep flooding of Webb Tract and Bacon Island. The Service does have concerns that many of the benefits to waterfowl and cranes will be negated by the increase in recreational activities, including hunting and hunting related disturbance. A5-8

Projected use for the islands indicates the project could result in a 21 percent increase in hunter-days available within the Delta. This impact has been characterized as less than

significant (page 3H-27) and as beneficial (page 3J-14). This increase in hunter use on the two habitat/mitigation islands will have a significant effect on how the islands will be utilized by waterfowl and shorebirds.

The Service recommends that until substantial benefits to waterfowl and shorebirds can be documented, current hunting levels be maintained. The Service considers the proposed hunting impacts as significant, reducing substantially the overall function and values accrued by the proposed mitigation. **A5-8 cont'd**

Closed hunting zones on both Bouldin Island and Holland Tract are largely surrounded by either free-roam or spaced-blind hunting zones. In most cases birds leaving closed zones must fly over hunted areas. Closed areas should be configured such that only one side of the closed area borders a open hunting area. **A5-9**

Implementation of proposed recreational development associated with the Delta Wetlands Project could result in an additional 1-2 percent boater use (800 registered boats) within the western Delta (page 3J-13). Increased wake and wave action associated with boating activities will contribute to significant existing levee erosion, loss of near-shore habitat, and result in additional needs for rip-rap. To mitigate for this impact Delta Wetlands project should create additional near-shore and shallow water habitat through the use of set- back levees. **A5-10**

Development of trap and skeet ranges as a result of the proposed Delta Wetlands Project does not appear to have been analyzed. The EIS/R mentions that trap and skeet ranges would be available for use, but does not analyze their projected use or placement.

Table 19 of the Habitat Management Plan states that: "Trap and Skeet ranges shall be restricted to recreational facilities (Figures 2 and 3). Ranges shall be configured to avoid deposition of lead shot into wetland habitats." This implies that there may be as many as 16 ranges constructed on the 2 habitat islands. **A5-11**

The EIS/R should clearly identify the number and location of these facilities. Furthermore, due to the potential of large numbers of waterfowl and shorebirds utilizing the mitigation islands, only steel shot should be utilized on these ranges. The use of steel shot reduces the potential of lead shot ingestion and poisoning by birds utilizing the islands and reduces future hazardous materials cleanup costs associated with closing shooting ranges.

The Delta Wetlands Project should consider an alternative to the proposed habitat cropping patterns proposed in the Habitat Management Plan. The existing proposal would reduce subsidence **A5-12**

on the islands but would not stop the process. An alternative of wet soil management should be evaluated.

All peat soil units should remain wet or shallowly flooded for 9 to 10 months of the year, with water removed between June and August of each year. Only mineral soils should be actively farmed and cropped. While this would result in reduced forage values for waterfowl, overall increases in habitat value would be realized as native habitats re-establish on the Delta Wetlands Project islands. A5-12 cont'd

SUMMARY COMMENTS

The proposed Delta Wetlands Project alternatives 1, 2, and 3 all would have significant adverse impacts on wildlife and fisheries. The proposed mitigation does not compensate for the loss of wildlife and habitat values, and the Project will contribute to significant cumulative impacts to aquatic resources of the Delta.

Because the proposed project would have significant adverse impacts on wildlife and habitat values, the Service continues to recommend against
permit issuance and certification of the draft EIS/R.

Thank you for the opportunity to comment.

Sincerely,

Patricia S Port

Patricia Sanderson Port
Regional Environmental Officer

cc: Director, OEPC, w/original incoming
Regional Director, FWS, Region I, Portland
Regional Director, BR, Sacramento

U.S. Department of the Interior

A5-1. This comment lists several letters that USFWS submitted to USACE between February 1988 and February 1993 regarding the proposed Delta Wetlands Project. Delta Wetlands revised the project proposal based on the input that USFWS and other commenters provided on the earlier proposal, then submitted new water right applications to the SWRCB in July 1993.

The comment also refers to a July 1995 letter from USFWS to USACE on the biological assessment addressing Delta Wetlands Project effects on fish species (Appendix F2 of the 1995 DEIR/EIS). Through the formal ESA consultation process, both NMFS and USFWS determined that the biological assessment was adequate for compliance with Section 7 of the federal ESA. Since this letter was submitted, USACE and USFWS have concluded formal consultation on project effects on listed fish species, and USFWS has issued no-jeopardy biological opinions regarding project effects on delta smelt and splittail. The opinions also address project effects on habitat for these species, including changes in X2 during Delta Wetlands diversions, and cumulative effects of the Delta Wetlands Project when considered in the context of other projects. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

Chapter 3H concludes that the Delta Wetlands Project would have several significant effects on wildlife (temporary construction impacts on state-listed species, disturbance to greater sandhill cranes and wintering waterfowl from aircraft operations, and potential for increased incidence of waterfowl diseases). The analysis in Chapter 3H concludes that implementation of the HMP (developed with DFG and in consultation with USFWS) on the habitat islands would fully compensate for the loss of wildlife and terrestrial habitat values on the reservoir islands. See responses to Comments A5-8 through A5-12 for discussions of specific issues raised by the commenter on the impact assessment for terrestrial wildlife and habitat.

A5-2. As described on pages 3D-11 and 3D-12 of the 1995 DEIR/EIS (page 3D-13 in FEIS Volume 1), postconstruction monitoring and maintenance of the levees would include a weekly inspection of the levees and removal of tall grasses, brush, and/or trees, as needed, to allow for visual levee inspection and reduce the risk of levee damage or leakage. Problems associated with muskrat burrows would be detected during weekly inspections, and Delta Wetlands would implement corrective actions. Results of the weekly inspections and resulting actions would be included in Delta Wetlands' quarterly report to the local reclamation districts and DWR.

A5-3. Only the habitat islands would be managed to provide wetlands. "Rapid flushing" is not proposed as a management strategy for wetlands on the habitat islands. Water circulation on the habitat islands and its potential effects on wildlife, including waterfowl, were considered during development of the HMP. The HMP design team developed prescriptions for water management in the HMP in consideration of water needs for vegetation management; seasonal waterfowl habitat requirements, including maintenance

of aquatic invertebrates as a food source; and the need for water circulation to reduce the risk of waterfowl disease outbreaks and to improve water quality.

A5-4. See response to Comment A2-1.

A5-5. The potential temperature-related effects of project operations on winter-run chinook salmon are addressed by the FOC, which have been incorporated into the proposed project. See "Increase in Temperature-Related Mortality of Juvenile Chinook Salmon" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

A5-6. Longfin smelt is no longer a candidate species for listing, as of February 28, 1996 (61 FR 40: 7457–7463).

Potential impacts of Delta Wetlands Project operations on longfin smelt were evaluated and identified in the biological assessment and in Chapter 3F of the 1995 DEIR/EIS. Any potential effects of project operations on longfin smelt are reduced by the operating terms detailed in the FOC, which were developed for the protection of listed species (e.g., delta smelt). See "Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows, Downstream Transport, Area of Optimal Salinity Habitat, and Entrainment" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

A5-7. The potential effects of project construction and operations on habitat are addressed by the USFWS, NMFS, and DFG biological opinions on the project. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

A5-8. The methods used to determine the types and area of habitat mitigation necessary to offset project impacts on wildlife are generally described in Chapter 3H of the 1995 DEIR/EIS on pages 3H-11 and 3H-12 (FEIS Volume 1 pages 3H-12 and 3H-13), and are described in detail in Appendix G3, "Habitat Management Plan for the Delta Wetlands Habitat Islands". The HMP design team (which consisted of representatives from the SWRCB and DFG and the lead agencies' consultant biologists, in consultation with USACE and USFWS) reviewed hunter densities associated with private duck hunting clubs and state and federal waterfowl refuges. Information on hunter use levels sustained on state and federal waterfowl refuges in the Central Valley was used to establish permissible hunter densities on the Delta Wetlands habitat islands. The HMP design team also assigned lower mitigation habitat values to portions of the habitat islands that would be hunted and required establishment of three closed hunting zones to provide onsite refuge for waterfowl, greater sandhill cranes, and other species during hunting periods (see 1995 DEIR/EIS pages 3H-19 and 3H-20 [FEIS pages 3H-21 and 3H-22]. Consequently, the HMP requires that Delta Wetlands provide more acres of waterfowl habitat for mitigation than would be required if hunting were not permitted on the habitat islands or was permitted to occur at the existing, very low levels of hunter use.

In addition to placing restrictions on hunter use levels, the HMP restricts hunter access and mobility and requires that hunter activity be monitored to ensure compliance with the hunting restrictions on the habitat islands (see pages 20–21 and Table 19 of Appendix G3). Mitigation monitoring is also required to determine whether mitigation habitats are providing the wildlife values intended by the HMP and provides for future changes in habitat island management, including potential reductions or increases in hunting levels, to increase mitigation habitat values if indicated through monitoring results (see pages 21–22 and Table 26 of Appendix G3).

A5-9. See response to Comment A5-8. When determining the placement and boundaries of the hunting zones, the HMP design team considered how human disturbance could affect wildlife in closed hunting zones and the compatibility of the layout with mitigation design objectives. Configuring the closed zones such that only one side of the closed area borders an open hunting area would reduce the habitat value of the closed zones for wildlife species. As described in response to Comment A5-8, the closed zones were designed in size, location, and juxtaposition to other habitat types to provide suitable refuge and high habitat values for wildlife species. The closed zones were configured by the HMP team for their site-specific characteristics (e.g., including the Bouldin Island lakes in closed zones to provide waterfowl resting areas) and for their interaction with neighboring habitats. Criteria used to design the habitat island habitats are described on pages 7–8 of Appendix G3.

The 1995 DEIR/EIS identifies as less-than-significant impacts the potential disruption of waterfowl use and increase in waterfowl harvest as a result of increased hunting on the Delta Wetlands Project islands (see Impacts H-18, H-19, and H-20). As described on page 3H-27 of the 1995 DEIR/EIS (FEIS page 3H-29), the HMP hunting program is designed to reduce hunter encroachment to levels that would not substantially disturb waterfowl over the long term.

A5-10. As part of the FOC terms and the DFG RPMs, Delta Wetlands is required to contribute to an aquatic habitat restoration fund, which will be used to purchase and manage habitat to mitigate effects of increased boat use. As manager of the funds, DFG will determine the best methods for establishing and maintaining shallow habitat, including the use of set-back levees. See also Master Response 5, “Mitigation of Environmental Effects Related to Use of Recreation Facilities”.

A5-11. As indicated in the HMP (Figures 4 and 5), Delta Wetlands may construct up to 16 recreation facilities on the perimeters of the habitat islands at the locations shown; however, Delta Wetlands has removed construction of these facilities from its CWA and Rivers and Harbors Act permit applications. See Master Response 5, “Mitigation of Environmental Effects Related to Use of Recreation Facilities”.

The HMP restricts trap/skeet ranges to the footprint of recreation facilities that may be developed in future years (see Table 19, page 1). A recreation facility would consist mainly of a parking lot, living quarters, and boat berths, as described in Appendix 2 of the

1995 DEIR/EIS. Land within the footprint of recreation facilities is not expected to be used by waterfowl. Areas intended for waterfowl use are outside the footprint of the recreation facilities, and as referenced by the commenter, the trap/skeet ranges would be configured to avoid deposition of lead shot into habitats used by waterfowl. Consequently, the potential for birds to ingest lead shot is low. Additionally, the HMP team considered restricting trap and skeet ranges to steel shot use only and concluded that this would not be practical; steel shot in sizes used for trap/skeet ranges is generally unavailable and costly.

Any hazardous materials cleanup costs associated with closing shooting ranges would be borne by the recreation facility owners. It should be noted that the design and use of the recreation facilities are subject to final approval by the counties.

A5-12. Delta Wetlands Project compensation goals and objectives for the habitat islands are detailed in the HMP (Appendix G3) on pages 2–7. One of the HMP management objectives is to reduce the rate of island subsidence through reduction in tilled acreage and restrictions on crop types adjacent to perimeter levees. Subsidence is a natural process that results primarily from conversion of peat soils into gas and is accelerated by tillage and other agricultural activities. Habitat management would slow the rate of subsidence on Bouldin Island and Holland Tract relative to subsidence rates under existing agricultural use (see Impact D-6 in Chapter 3D, "Flood Control"). Management of the islands to further reduce subsidence would require development of habitat types with wildlife values insufficient to achieve other compensation objectives. As described under "Management Monitoring Programs and Performance Standards" in the HMP (pages 21–22), changes in habitat types and management, including conversion of managed croplands to wetlands, are permissible in future years if monitoring indicates that these changes would meet the goals of the HMP.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

DEC 21 1995

Colonel John N. Reese
District Engineer
Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814-2922

Attention: Jim Monroe

Subject: Public Notice (PN) 190109804, Draft EIR/EIS Delta Wetlands Project, CA

Dear Colonel Reese:

The Environmental Protection Agency (EPA) has reviewed the Public Notice (PN) 190109804, dated September 22, 1995, regarding a proposal for four Delta islands in Contra Costa and San Joaquin Counties. These comments have been prepared under the authority of and in accordance with the provisions of the Federal Guidelines (40 CFR 230) promulgated under section 404(b)(1) of the Clean Water Act.

Site & Project Description

The project proponent's preferred project would provide for direct diversion and diversion to storage of unregulated surplus Delta water flow onto four Delta islands: Bacon Island and Bouldin Island in San Joaquin County, and Holland Tract and Webb Tract in Contra Costa County. Bacon Island and Webb Tract would be used for storage of water for later sale or release for Delta export or to meet Bay-Delta Estuary water quality or flow requirements. Water would be diverted onto these islands, subject to regulatory constraints, during times of demand throughout the year. Bouldin Island and Holland Tract would be used primarily for management of wetlands and wildlife habitat. Water would be seasonally diverted onto these islands, with subsequent water discharge, pursuant to the requirements for management of the wetland and wildlife habitat; this discharged water may also be used for later sale or release for Delta export or to meet Bay-Delta Estuary water quality or flow requirements. The applicant's water storage operations would involve inundation of jurisdictional waters of the United States, including wetlands, on the reservoir islands.

This project would also include construction of recreation facilities along the perimeter levees on all four islands, operation of a private airstrip on Bouldin Island, and, during periods of non-storage, management of shallow water within an inner levee system on Bacon Island and Webb Tract.

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Recommendations

EPA believes that the underlying benefit of this project is an increased amount of water available for numerous beneficial uses, for the citizens and environment in California. We appreciate the efforts of the applicant to construct this unique project in a way that minimizes most wetland impacts. Although we are supportive of the project and believe the 404 (b)(1) Alternatives Analysis submitted is adequate, we have the several concerns and recommend that the Corps resolve these concerns with the applicant prior to permit authorization. A6-1

EPA shares the concerns expressed by the National Marine Fisheries Service (NMFS) and the Fish and Wildlife Service (FWS) on the potential to affect winter-run chinook salmon and its associated habitat, through construction activities (both long and short-term) and water transfer. Therefore, EPA strongly recommends that any special conditions proposed by NMFS or FWS be incorporated into the permit. A6-2

We are also concerned about the erosional impacts that may be caused by the construction and operation of the planned marinas. Care should be taken to fully minimize the possible impacts to wetlands and associated habitats caused by construction activities and boat wake. The planned facilities include as many as 30 boat berths per facility in adjacent channels and 36 boat berths per facility on the island interiors. We question the need for this density of facilities on such sensitive habitat and strongly recommend that these facilities be scaled back to a lower density. A6-3

We appreciate the opportunity to comment on this public notice and look forward to resolving our concerns with the proposed project. If you have any questions about these comments, please contact Tony Lewis of my staff at 415/744-1973.

Sincerely,

Jeff Rosenbloom, Chief
Wetlands & Sediment Management Section

cc: Applicant
USFWS, Sacramento
CDFG, Sacramento
SWRCB, Balaguer, Sacramento
NMFS, Mobley, Long Beach

U.S. Environmental Protection Agency, Region IX (Wetlands and Sediment Management)

A6-1. USACE acknowledges the commenter's evaluation of the project and the 404(b)(1) Alternatives Analysis presented in Appendix 4 of the 1995 DEIR/EIS. See responses to Comments A6-2 and A6-3 for responses about specific concerns expressed in this letter.

A6-2. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for a discussion of the measures incorporated into the project description to protect winter-run chinook salmon and other aquatic species. Delta Wetlands will be required to implement the terms of the biological opinions as part of its operating conditions.

A6-3. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

January 18, 1996

Colonel John N. Reese
District Engineer
Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814-2922
Attention: Jim Monroe

Dear Colonel Reese:

The Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the **Delta Wetlands Project,** Contra Costa and San Joaquin Counties. Our review is provided pursuant to the National Environmental Policy Act (NEPA) [42 USC 4231 et seq.], Council on Environmental Quality (CEQ) regulations [40 CFR Parts 1500-1508] and Section 309 of the Clean Air Act.

The Delta Wetlands Project proposes to divert approximately 312,000 acre feet of Delta winter outflow for diversion to storage onto four Delta islands: Bacon Island and Bouldin Island in San Joaquin County, and Holland Tract and Webb Tract in Contra Costa County. Bacon Island and Webb Tract would be used for storage of water for later sale or release for Delta export or to meet Bay-Delta Estuary water quality or flow requirements. Water would be diverted onto these islands, subject to regulatory constraints, during times of demand throughout the year. Bouldin Island and Holland Tract would be used primarily for management of wetlands and wildlife habitat. This project would also include construction of recreation facilities along the perimeter levees on all four islands, operation of a private airstrip on Bouldin Island, and, during periods of non-storage, management of shallow water within an inner levee system on Bacon Island and Webb Tract. The applicants are seeking appropriative water rights from the State Water Resources Control Board and a Clean Water Act Section 404 permit from the Corps of Engineers (COE). This comment letter is to arrive by January 18, 1996, as agreed upon, due to the government shutdown in December, 1995.

Based on our review, we have assigned the DEIS a rating of **EC-2 (Environmental Concerns-Insufficient Information).** This EC-2 Rating is further defined in the attached "Summary of the EPA Rating System." EPA commends the COE for addressing many of the concerns that EPA and other resource agencies expressed regarding the need for disclosure of additional information regarding the project. We also commend the COE for the clarity and thoroughness of the analysis in the DEIS. Also, we support the Delta Wetlands project proposal to establish a "Delta Wetlands Environmental Research Fund," supported by export water sales (DEIS, p. 2-9). A7-1

We have assigned the EC-2 rating because of potential for movement of optimum salinity conditions upstream. While this may be done while "not violating water quality objectives," it does represent a possible significant adverse impact (as an indicator of reduction of optimum environment for key components of the Bay Delta ecosystem). EPA is also concerned that diversions onto the islands may significantly attenuate pulse flows associated with spring storms. The Final Environmental Impact Statement (FEIS) should include more specific information regarding project impacts to optimum salinity conditions and to spring pulse flows. Finally, as described in the DEIS, Delta Wetlands operations are not integrated with operation of the State Water Project and Central Valley Project. In general, EPA recommends that the FEIS include discussion regarding the relationship of the project to other Bay/Delta diverters, notably, the State Water Project and Central Valley Project. Potential environmental benefits and adverse impacts of project operations could change substantially if the operation of the projects were integrated. **A7-1 cont'd**

We appreciate the opportunity to review and provide comments on the DEIS. Please send two copies of the FEIS to this office at the same time it is officially filed with our Washington, D.C. office. If you have any questions, please feel free to contact me at (415) 744-1584, or have your staff contact Carolyn Yale regarding aquatic resource issues at 744-1580, or Edward Yates regarding NEPA issues at (415) 744-1571.

Sincerely,

Jeanne Geselbracht

for David Farrel, Chief
Office of Federal Activities

enclosures (2)
MI# 001001. DELTWET.DEI

cc: USFWS, Sacramento
CDFG, Sacramento
SWRCB, Balaguer, Sacramento
NMFS, Mobley, Long Beach

SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTION

Environmental Impact of the Action

LO-Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO-Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU-Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of environmental quality, public health or welfare. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommend for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1-Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2-Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3-Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From: EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

AQUATIC RESOURCES

1. EPA believes that the appropriate reference conditions for evaluating impacts of the Delta Wetlands (DW) project are the "baseline" conditions represented by operation of existing water project facilities in accordance with the 1995 Bay/Delta Water Quality Control Plan (WQCP). It is important to emphasize that operating the project to meet the WQCP does not imply "no adverse impacts" to aquatic resources [DEIS, pp. A-1 to A-8]. The project should be designed and operated to ensure minimal adverse impacts to aquatic resources protected under the WQCP; impacts which cannot be avoided should be offset by measures consistent with overall objectives for Bay/Delta ecosystem restoration. The Final EIS should provide more specificity regarding mitigation measures which would accomplish this. A7-2

2. The DEIS discloses that operations of the DW project would move "x2" (the 2ppt isohaline) deeper into the Delta (3F-17). This is evaluated as an "minor" or "insignificant" impact which would not adversely affect fish habitat or violate water quality standards (WQCP) [DEIS, p. A-23, 3F-26]. We cannot concur that this degradation of salinity conditions during certain periods of the year is insignificant. The Final EIS should discuss ways in which the project can be modified to minimize this effect.

EPA questions the use of changes in the *surface area* of "optimal salinity conditions," rather than location of x2 per se, as the indicator of impacts on fish and invertebrate abundance. The location of x2 (2ppt bottom salinity) is closely associated with relative abundance of estuarine organisms, and with organic matter entering the food web. The Final EIS needs to provide additional scientific justification for use of surface area of optimal salinity conditions as an indicator of estuarine conditions. A7-3

Also, we question the conclusion that diverting large amounts of water for short periods would have "less than significant impacts." (Page 3F-26 states that Delta outflow could be reduced by as much as 9,000 cfs during initial days of filling.) We are concerned that large diversions during sensitive periods-- for instance, diversion of first storm pulses during the winter and spring-- could have significant impacts on any of the species which have eggs, larvae or juveniles present in the Delta.

Finally, the DEIS has not provided impact information on components of the Bay/Delta ecosystem closely associated with x2 and outflow, such as supply of particulate organic carbon, abundance of Neomysis, and starry flounder. This information should be included in the Final EIS.

3. Alternative 2 differs from Alternative 1 by not constraining DW island discharges and water export according to the export limits set in the WQCP. Not adhering to the prescribed pumping limits is counter to a strict interpretation of WQCP requirements and, more importantly, would result in more adverse salinity conditions in the South Delta. As we have explained above, EPA will not accept as a baseline or "floor" anything other than the current facilities and operations agreements in place. New projects must (to the fullest extent possible) avoid adverse impacts relative to these baseline conditions. A7-4

4. The DEIS suggests that water from the Delta Wetlands islands could contribute to outflow and, if coordinated with or integrated into upstream reservoir operations, could substitute for upstream flow releases to meet Bay/Delta outflow requirements [p. 3B-21, 3F-12]. The benefits of using Delta Wetlands water for outflow, particularly if it substitutes for rather than augments upstream releases, need to be documented more thoroughly in the EIS. The Delta Wetlands DEIS notes that instream flows would not be allowed to fall below required levels. However, in many instances, currently required flows are well below the levels needed for fisheries restoration. Substitution of Delta Wetlands water for reservoir releases should support implementation of the Anadromous Fish Restoration Plan. A7-5

5. EPA is concerned that DW could be operated to divert water during spring periods when delta smelt larvae, juveniles, or adults are present (DEIS, 3F-25). The FEIS should include more specific information regarding the time period, hydrologic conditions, and resources of concern associated with spring diversions and the delta smelt.

WETLANDS

A7-6

1. EPA appreciates the efforts of the applicant to construct this project in a way that minimizes most wetland impacts. EPA has commented on the Clean Water Act Section 404 permit application in a letter to you from Jeff Rosenbloom. A summary of the concerns identified in that letter follow. EPA shares the concerns expressed by the National Marine Fisheries Service (NMFS) and the Fish and Wildlife Service (FWS) on the potential to affect winter-run chinook salmon and its associated habitat, through construction activities (both long and short-term) and water transfer. Therefore, EPA strongly recommends that any special conditions proposed by NMFS or FWS be incorporated into the permit.

2. We are also concerned about the erosional impacts that may be caused by the construction and operation of the planned marinas. Care should be taken to fully minimize the possible impacts to wetlands and associated habitats caused by construction activities and boat wake. The planned facilities include as many as 30 boat berths per facility in adjacent channels and 36 boat berths per facility on the island interiors. We question the need for this density of facilities on such sensitive habitat and strongly recommend that these facilities be scaled back to a lower density. A7-7

ENDANGERED SPECIES ACT COMPLIANCE

1. EPA recommends that the FEIS include more information regarding aquatic habitat loss and impacts on Bay/Delta fish species as requested by the U.S. Department of Interior letter commenting on the DEIS (Letter to you from Patricia Port, Regional Environmental Officer, December 14, 1995). The FEIS should include the biological opinions concluding consultations on the delta smelt and winter-run chinook. Also, project changes required through the Endangered Species Act should be identified. A7-8

U.S. Environmental Protection Agency, Region IX (Office of Federal Activities)

A7-1. The lead agencies have noted EPA's "Environmental Concerns—Insufficient Information" rating of the 1995 DEIR/EIS. The 2000 REIR/EIS contains additional information that addresses this comment. The FOC, which have been incorporated into the project, limit the timing and magnitude of project diversions based on the value of X2, an indicator of optimal salinity habitat (see Appendix B of the 2000 REIR/EIS).

A7-2. The DeltaSOS model was used to simulate water supply conditions and Delta Wetlands diversion and discharge operations for assessment of the project's potential effects on water supply, hydrodynamics, water quality, and fishery resources. DeltaSOS modeling was based on the initial water budget developed from results of simulations performed by DWR using the operations planning model DWRSIM. The modeling was based on anticipated regulatory standards, facilities, and demands for export. As described in Chapter 3A of the 1995 DEIR/EIS and Chapter 3 of the 2000 REIR/EIS, the DeltaSOS model assumed implementation of the 1995 WQCP objectives, as interpreted by DWR (see FEIS Chapter 3A).

The impact analyses of the 1995 DEIR/EIS concluded that the project could result in several significant effects on water quality and fisheries; mitigation measures were recommended to reduce impacts to a less-than-significant level.

See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for a discussion of the biological opinion measures that were incorporated into the project description to reduce potential project effects on aquatic resources to a less-than-significant level. These measures also reduce potential project effects on salinity.

A7-3. The mechanism affecting the relative abundance of estuarine organisms is currently unknown; however, the optimal salinity habitat area and Delta outflow appear to be as closely associated with abundance of estuarine organisms as is X2.

DFG, NMFS, and USFWS addressed concerns about project effects on X2 and optimal salinity habitat by including in the FOC several terms that directly limit the change in the location of X2 that Delta Wetlands diversions would be allowed to cause. These terms are described generally in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", and are described in more detail below. The full FOC text is included in Appendix B of the 2000 REIR/EIS.

Diversion measure 1 requires that X2 be at or downstream of Chipps Island (kilometer [km] 74) before Delta Wetlands begins initial diversions to storage for the current water year. This requires an effective outflow of about 12,000 cubic feet per second (cfs). Diversion measure 2 requires that X2 remain at or downstream of Collinsville (km 81) during Delta Wetlands diversions in September through March. Diversion measure 3 prohibits Delta Wetlands diversions from causing an upstream

movement of X2 of more than 2.5 km during October through March; this restriction is generally equivalent to limiting diversions to about 25% of outflow. Diversion measure 6 limits project diversions to 25% of outflow from October through December and to 15% of outflow from January through March. The latter restriction would limit the upstream movement of X2 to less than 1.5 km during January through March. These FOC diversion measures are designed to prevent Delta Wetlands Project operations from interfering with the estuarine habitat protection provided by the WQCP X2 objectives.

The FOC and RPMs provide numerous other protections through restrictions on Delta Wetlands diversions. See the listing of diversion criteria under "Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows, Downstream Transport, Area of Optimal Salinity Habitat, and Entrainment" in Master Response 4. The protections provided through the biological opinions benefit nonlisted species such as starry flounder in addition to listed species.

A7-4. The commenter states that under Alternative 2, project discharges would not be constrained by the export limits set in the 1995 WQCP. In-Delta storage was not anticipated as part of SWP and CVP operations; as a result, the 1995 WQCP does not address how discharges for export from in-Delta (e.g., Delta Wetlands) storage would be factored into the calculations of inflow in the E/I ratio. Therefore, the 1995 DEIR/EIS analysis was based on the assumption that the project would be constrained by the export limits, but provided two interpretations of how the limits would apply to the proposed project. The assumptions on which Alternatives 1 and 2 are based do not affect the baseline used for the impact analysis; see response to Comment A7-2 regarding the assumptions for baseline conditions.

As described in the 1995 DEIR/EIS and the 2000 REIR/EIS, Delta Wetlands Project operations would not affect compliance with the minimum-outflow objectives in the 1995 WQCP, and they would not affect inflow from the San Joaquin, Sacramento, or Mokelumne Rivers. Therefore, project discharges would not affect salinity conditions in the south Delta as they relate to river inflows or Delta outflow; the project could affect salinity only if Delta Wetlands discharged water with salinity higher than that of the receiving water or if diversions resulted in substantial seawater intrusion. Project effects on salinity are evaluated in Chapter 3C of the 1995 DEIR/EIS and Chapter 4 of the 2000 REIR/EIS (see FEIS Chapter 3C). See also responses to Comments A2-2 and A4-3.

A7-5. See Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow", for discussion regarding the use of Delta Wetlands discharges to provide water for outflow.

A7-6. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for a description of the FOC terms and RPMs included in the NMFS, USFWS, and DFG biological opinions and incorporated into the project description to protect delta smelt, winter-run chinook salmon, and other aquatic species and their habitats. If the lead agencies approve Delta Wetlands' permit applications,

Delta Wetlands will be required to implement the terms of the biological opinions as part of its operating conditions. The letter from Jeff Rosenbloom of the Wetlands and Sediment Management Section is comment letter A6 of this volume; see also the individual responses to comments in that letter above.

A7-7. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

A7-8. The DFG, NMFS, and USFWS biological opinions were included in Appendices C, D, and E, respectively, of the 2000 REIR/EIS. For the assessments of water supply and operations and of water quality, new simulations of project diversion and discharge operations were performed; these included the project operating parameters detailed in the biological opinions. Chapter 5 of the 2000 REIR/EIS described how the FOC and RPMs included in the biological opinions reduce project effects on aquatic habitat and fisheries to a less-than-significant level (see FEIS Chapter 3F). See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

Section B. State Agencies

Letter B1

STATE OF CALIFORNIA

PETE WILSON, Governor

DELTA PROTECTION COMMISSION
14215 RIVER ROAD
P.O. BOX 530
WALNUT GROVE, CA 95690
PHONE: (916) 776-2290
FAX: (916) 776-2293

September 15, 1995

Jim Sutton
SWRCB
P.O. Box 2000
Sacramento, CA 95812-2000

Subject: Delta Wetlands Project; SCH No. 95093022

Dear Mr. Sutton:

I am writing regarding the above above-named project. The project has not been reviewed by the Commission, so these are staff comments only.

The proposed Delta Wetlands Project is located in the Primary Zone of the Delta in both Contra Costa and San Joaquin Counties (see map enclosed). Section 29723(a) of the Delta Protection Act of 1992 states "'development' means on, in, over, or under land or water, the placement or erection of any solid material or structure; discharge of any dredged material or of any gaseous, liquid, solid, or thermal waste; grading, removing, dredging, mining, or extraction of any materials; change in the density or intensity of use of land...construction, reconstruction, demolition, or alteration of the size of any structure, including any facility of any private, public, or municipal utility; and the removal or harvesting of major vegetation other than for agricultural purposes."

The Delta Protection Act does <u>not</u> apply to actions of State or federal agencies, only to actions of local governments. Actions which may require local government approval include: authorization of private recreational facilities, hunting clubs, etc.

The Delta Protection Act states that local government (Contra Costa and San Joaquin Counties) may approve "development" within the Primary Zone only after making all the following written findings on the basis of substantial evidence in the record (Section 29765). For those portions of the project subject to local approval, each County must find: **B1-1**

(a) The development will not result in wetland or riparian loss.

(b) The development will not result in the degradation of water quality.

(c) The development will not result in increased nonpoint source pollution or soil erosion, including subsidence or sedimentation.

(d) The development will not result in degradation or reduction of Pacific Flyway habitat.

(e) The development will not result in reduced public access, provided that access does not infringe upon private property rights.

(f) The development will not expose the public to increased flood hazards.

(g) The development will not adversely impact agricultural lands or increase the potential for vandalism, trespass, or the creation of public or private nuisances on private or public land. **B1-1 cont'd**

(h) The development will not result in the degradation or impairment of levee integrity.

(i) The development will not adversely impact navigation.

(j) The development will not result in any increased requirements or restrictions upon agricultural practices in the Primary Zone.

The environmental documents prepared regarding this project do indicate that the project is located in the Primary Zone of the Delta and include the analysis required by local governments.

Please feel free to call if you have any questions about these comments.

Sincerely,

Margit Aramburu
Executive Director

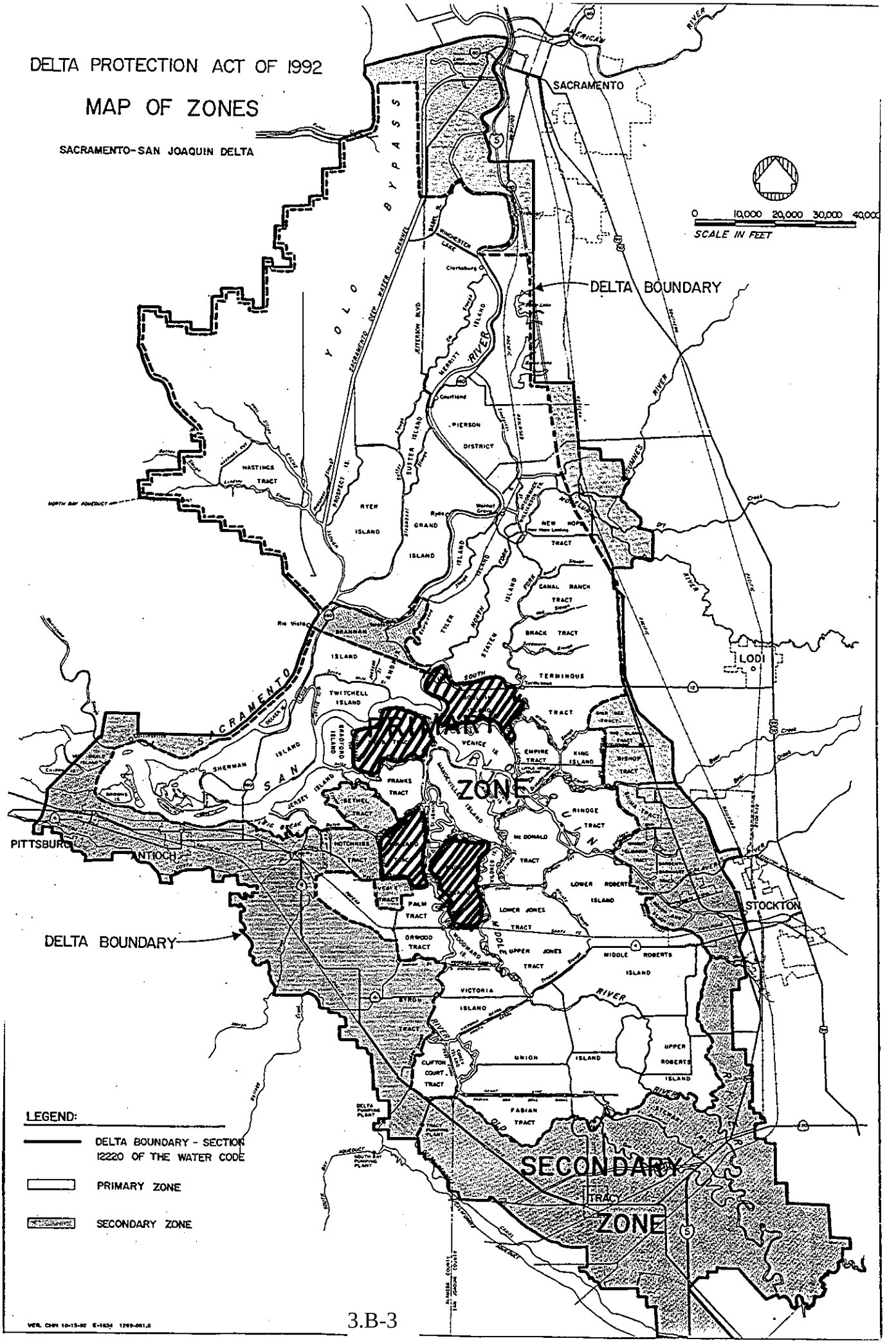
Enclosure

cc: Supervisor Tom Torlakson
Supervisor Ed Simas
Roberta Goulart
Peggy Keranen

DELTA PROTECTION ACT OF 1992

MAP OF ZONES

SACRAMENTO-SAN JOAQUIN DELTA



Delta Protection Commission

B1-1. The commenter notes that the Delta Protection Act would apply to the Delta Wetlands Project because permits for the recreation facilities and any land use permits would require local government approval. Evidence to address the findings listed in the comment can be found in the following sections of Volume I of this FEIS (the letters correspond to the statements in the comment):

(a) Chapter 3G, "Vegetation and Wetlands";
(b) Chapter 3C, "Water Quality";
(c) Chapter 3C, "Water Quality";
(d) Chapter 3H, "Wildlife";
(e) Chapters 3J, "Recreation and Visual Resources", and 3L, "Traffic and Navigation";
(f) Chapter 3D, "Flood Control";
(g) Chapter 3I, "Land Use and Agriculture";
(h) Chapter 3D, "Flood Control";
(i) Chapter 3L, "Traffic and Navigation"; and
(j) Chapter 3I, "Land Use and Agriculture".

The commenter states: "The environmental documents prepared regarding this project... include the analysis required by local governments". With this statement, the commenter verifies that the 1995 DEIR/EIS includes sufficient information for local governments to make findings under the Delta Protection Act.

Additionally, an analysis has been completed to examine the Delta Wetlands Project's consistency with the goals of the Delta Protection Commission's Land Use and Resource Management Plan for the Primary Zone of the Delta (1995); see the following table. This information has been added to Table 3I-7.

Table B1-1. Delta Protection Commission—Land Use and Resource Management Plan for the Primary Zone of the Delta

Policy/Principle	Consistency	
Environmental Principles		
P-1. The priority land use of areas of prime soil shall be agriculture. If commercial agriculture is no longer feasible due to subsidence or lack of adequate water supply or water quality, land uses which protect other beneficial uses of Delta resources, and which would not adversely affect agriculture on surrounding lands, or viability or cost of levee maintenance, may be permitted. If temporarily taken out of agriculture production due to lack of adequate water supply or water quality, the land shall remain reinstatable to agricultural production for the future.	Partially Inconsistent	Implementation of the proposed project would remove agricultural land from production; however, the proposed project would not affect agricultural activities on surrounding land, and, with the exception of borrow-pit areas, the land could be returned to agricultural use if project operations were terminated.
P-2. Agricultural and land management practices shall minimize subsidence of peat soils. Local governments shall support study of agricultural methods which minimize subsidence and assist in educating landowners and managers as to the value of utilizing these methods.	Consistent	Implementation of the Delta Wetlands Project would minimize subsidence on Webb Tract, Holland Tract, Bacon Island, and Bouldin Island.
P-3. Lands managed primarily for wildlife habitat shall be managed to provide several inter-related habitats. Delta-wide habitat needs should be addressed in development of any wildlife habitat plan. Appropriate programs, such as “Coordinated Resource Management and Planning” and “Natural Community Conservation Planning” should ensure full participation by local government and property owner representatives.	Consistent	Habitat management under the proposed project would provide open space, protection of endangered species, and preservation of wildlife habitat. Bouldin Island and Holland Tract would be managed to provide breeding and foraging habitat for several wildlife species groups.
Utilities and Infrastructure Policies		
P-2. New houses built in the Delta agricultural areas shall continue to be served by independent potable water and wastewater treatment facilities. Uses which attract a substantial number of people to one area, including any expansions to the Delta communities, recreational facilities, or businesses, shall provide adequate infrastructure improvements or pay to expand existing facilities, and not overburden the existing limited community resources. New or expanded construction of wastewater disposal systems shall ensure highest feasible standards are met. Independent treatment facilities shall be monitored to ensure no cumulative adverse impact to groundwater supplies.	Consistent	Drinking water for recreation facilities would be imported as needed or supplied using onsite treatment subject to county and state standards. Sewer disposal would comply with the requirements of the Central Valley Regional Water Quality Control Board. A private solid waste collection agency certified to operate in Contra Costa and San Joaquin Counties would be contracted to serve the recreation facilities.

Table B1-1. Continued

Policy/Principle	Consistency	
Land Use		
P-6. Subsidence control shall be a key factor in evaluating land use proposals.	Consistent	Implementation of the proposed project would not accelerate subsidence.
P-7. Structures shall be set back from levees and areas which may be needed for future levee expansion.	Consistent	The proposed project would improve levees on all four project islands. Although recreational facilities would be located adjacent to the levee crest, they would not interfere with future levee expansion.
Agriculture		
P-1. Commercial agriculture in the Delta shall be supported and encouraged as a key element in the State's economy and in providing the food supply needed to sustain the increasing population of the State, the Nation, and the world.	Inconsistent	Implementation of the proposed project would result in land being removed from agricultural production.
P-8. Encourage management of agricultural lands which maximize wildlife habitat seasonally and year-round, through techniques such as sequential flooding in fall and winter, leaving crop residue, creation of mosaic of small grains and flooded areas, controlling predators, controlling poaching, controlling public access, and others.	Consistent	Agricultural fields on the habitat islands will be managed to maximize wildlife habitat values. Requirements specified in the habitat management plan call for the provision of high-value foraging habitat for wintering waterfowl through creation of fields of corn rotated with wheat, mixed agriculture/seasonal wetland, seasonal managed wetland, and pasture/hay fields.

Table B1-1. Continued

Policy/Principle	Consistency	
Water		
P-1. Salinity levels in Delta waters shall ensure full agricultural use of Delta agricultural lands, provide habitat for aquatic life, and meet requirements for drinking water and industrial uses.	Consistent	The Delta Wetlands Project would not result in conflicts with the requirements of the 1995 Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary (WQCP) for agricultural water quality. The final operations criteria and other reasonable prudent measures adopted as part of the Endangered Species Act consultation process include restrictions on project operations to minimize effects on aquatic habitat and fish. Project effects on drinking water quality would be reduced to a less-than-significant level through the implementation of the mitigation measures.
P-2. Design, construction, and management of any flooding program to provide seasonal wildlife habitat on agricultural lands shall incorporate "best management practices" to minimize mosquito breeding opportunities and shall be coordinated with the local vector control district. Each of the four vector control districts in the Delta provides specific wetland/mosquito management criteria to landowners within their district.	Consistent	Implementation of the proposed project would result in the need for a significant increase in abatement levels on Delta Wetlands Project islands. Coordination with responsible mosquito abatement districts and implementation of appropriate abatement practices would offset the creation of potential mosquito production sources under the Delta Wetlands Project alternatives.
P-3. Water agencies at local, state, and federal levels shall work together to ensure that adequate Delta water quality standards are set and met and that beneficial uses of State waters are protected consistent with the CALFED agreement.	Consistent	Implementation of the Delta Wetlands Project would require ongoing consultation with water agencies at the state, federal, and local levels.
Recreation and Access		
P-2. To minimize impacts to agriculture and to wildlife habitat, local governments shall encourage expansion of existing private water-oriented commercial recreational facilities over construction of new facilities. Local governments shall ensure any new recreational facilities will be adequately supervised and maintained.	Inconsistent	Implementation of the Delta Wetlands Project would include the construction of several new private recreation facilities in the Delta.

Table B1-1. Continued

Policy/Principle	Consistency	
Levees		
P-1. Delta levees shall be maintained to protect human life, to provide flood protection, to protect private and public property, to protect historic structures and communities, to protect riparian and upland habitat, to promote interstate and intrastate commerce, to protect water quality in the state and federal water projects, and to protect recreational use of the Delta area. Delta levee maintenance and rehabilitation shall be given priority over other uses of the levee areas. To the extent levee integrity is not jeopardized, other uses, including support of vegetation for wildlife habitat, shall be allowed.	Consistent	Levee improvements on the project reservoir islands would include raising and widening existing levees to bear the stresses of interior water storage of up to 6 feet. Levee improvements for both habitat and reservoir islands would be designed to meet or exceed state-recommended criteria for levees outlined in California Department of Water Resources Bulletin 192-82.

Letter B2

STATE OF CALIFORNIA—THE RESOURCES AGENCY

PETE WILSON, *Governor*

DEPARTMENT OF BOATING AND WATERWAYS
1629 S STREET
SACRAMENTO, CA 95814-7291
(916) 445-6281

September 19, 1995

Mr. Jim Sutton
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, California 95812-2000

Mr. Jim Monroe
U.S. Army Corps of Engineers
Regulatory Branch
1325 "J" Street, Room 1444
Sacramento, California 95814-2922

Dear Mr. Sutton and Mr. Monroe:

Thank you for the opportunity to review the Delta Wetland Environmental Impact Report. Since the project would occur in or near navigable waterways, i.e., the Delta, the Department would like to offer the following recommendations:

1) If waterway markers are proposed to a warn boaters of construction activities, barges, controlled speed areas, etc., it is recommended that the project applicant receive a copy of the State's Waterway Marking System Regulations, i.e., Section 7000, et seq., of the California Code of Regulations, to be aware of placement requirements (copy enclosed). **B2-1**

2) If the State project proponent (DWR), or any local government entity, need(s) to enact regulation(s) to regulate boating activities in the affected area, these regulations must be enacted only in the areas allowed pursuant to Section 660(a) of the California Harbors and Navigation Code (copy enclosed). **B2-2**

   Additionally, these regulations(s), if enacted by state or local government agencies, must be submitted for review and approval to the Department of Boating and Waterways, in accordance with Section 662 of the California Harbors and Navigation Code (copy enclosed).

3) The air strip on Bouldin Island, referred to on page 18 of the *Executive Summary of the EIR/EIS Delta Wetlands Project*, under "Recreational Facilities", may have an affect on wind-propelled craft or small paddle crafts in the area, if aircraft use low-flying approaches in take-offs and landings. **B2-3**

Therefore, it is recommended that if small airplanes or helicopters use (or will use) this facility on a regular basis, consideration should be given to boating safety and navigation, especially in the presence of wind-propelled craft, such as sailboats and wind-surfers, and small manually propelled craft, such as canoes and kayaks. **B2-3 cont'd**

If you have questions regarding these comments, please contact Mike Sotelo of my staff at (916) 322-1823.

Sincerely,

John R. Bañuelos
Director

Enclosure

(b) All floodlights or headlights which may interfere with the proper navigation of an approaching vessel shall be so shielded that the lights will not blind the pilot of such vessel.

NOTE: Authority cited: Sections 652 and 655.3, Harbors and Navigation Code. Reference: Sections 652 and 655.3, Harbors and Navigation Code.

6697. Prima-Facie Evidence of Negligent Operation.

Pursuant to the provisions of Section 655 of the Harbors and Navigation Code, the following described acts endanger life, limb or property and constitute evidence of reckless or negligent operation:

(a) Riding on the bow, gunwale or transom of a vessel propelled by machinery underway when such position is not protected by railing or other reasonable deterrent to falling overboard, or riding in a position or manner which is obviously dangerous. These provisions shall not apply to a vessel's crewmen in the act of anchoring, mooring or making fast to a dock or another vessel, or the necessary management of a sail.

(b) Maneuvering towed skiers, or other devices, so as to pass the towline over another vessel or its skier.

(c) Navigating a vessel, skis or other devices between a towing vessel and its tow or tows.

NOTE: Authority cited: Sections 652 and 655, Harbors and Navigation Code. Reference: Sections 650, 655 and 655.3, Harbors and Navigation Code.

Article 6. Waterway Marking System

7000. Scope.

Pursuant to the authority vested in it by Section 659, Harbors and Navigation Code, the Department adopts rules and regulations for a uniform system for marking the State's waters; such rules and regulations to establish, (a) a system of regulatory markers for use on all waters of the State to meet needs not provided for by the U.S. Coast Guard system of navigational aids, and (b) a system of navigational aids for use on the waters of the State not marked by the U.S. Coast Guard and/or not determined to be United States navigable waters; provided that such rules and regulations shall not be in conflict with the markings prescribed by the U.S. Coast Guard.

NOTE: Authority cited: Section 659, Harbors and Navigation Code. Reference: Sections 650 and 659, Harbors and Navigation Code.

7001. Definition (as used in this article).

(a) Waterway marker is any device designed to be placed in, on or near the water to convey an official message to a boat operator on matters which may affect health, safety, or well being, except that such devices of the United States or an agency of the United States are excluded from the meaning of this definition.

(b) Regulatory Marker is a waterway marker which has no equivalent in the U.S. Coast Guard system of navigational aids.

(c) State Aid to Navigation is a waterway marker which is the equivalent of a U.S. Coast Guard aid to navigation.

(d) Buoy is any device designed to float which is anchored in the water and which is used to convey a message.

(e) Sign is any device for carrying a message which is attached to another object such as a piling, buoy, structure or the land itself.

(f) A Display Area is the area on a sign or buoy needed for display of a waterway marker symbol.

(g) Symbols are geometric figures such as a diamond, circle, rectangle, used to convey a basic message.

(h) "Department" means the Department of Boating and Waterways.

NOTE: Authority cited: Section 659, Harbors and Navigation Code. Reference: Sections 650 and 659, Harbors and Navigation Code.

7002. Waterway Markers Used on the Waters of This State Shall Be As Follows.

(a) State Aids to Navigation.

(1) A red buoy or sign shall indicate that side of a channel to be kept to the right of a vessel when entering the channel from the main water body or when proceeding upstream; a green buoy or sign shall indicate that side of a channel to be kept to the left of a vessel when entering the channel from the main water body or when proceeding upstream.

These buoys or signs shall normally be used in pairs and only for the purpose of marking a clearly defined channel.

(2) A red and white vertically striped buoy or sign shall indicate the center of a navigable waterway.

(3) A red and green horizontally striped buoy or sign shall indicate a junction in the channel, or a wreck or obstruction which may be passed on either side. If the top band is red, the preferred channel is to the left when proceeding upstream or leaving the main water body. If the top band is green the preferred channel is to the right when proceeding upstream or leaving the main water body.

(4) White buoys shall indicate anchorage areas.

(5) The shapes of state aids to navigation shall be compatible with the shapes established by Coast Guard regulations for the equivalent Coast Guard aids to navigation.

(6) When lights are placed on buoys as an aid to navigation, their characteristics shall be compatible with those designated by Federal Regulations for federal aids to navigation. Red lights for this purpose shall be used only on red buoys and green lights only on green buoys.

(b) Regulatory Markers.

(1) A diamond shape of international orange with white center shall indicate danger. The nature of the danger may be indicated by words or well-known abbreviations in black letters inside the diamond shape, or above and/or below it on white background.

(2) A diamond shape of international orange with a cross of the same color within it against a white center without qualifying explanation shall indicate a zone from which all vessels are excluded.

(3) A circle of international orange with white center will indicate a control or restriction. The nature of the control or restriction shall be indicated by words, numerals, and/or well-known abbreviations in black letters inside the circle. Additional explanation may be given above and/or below it in black letters on white background.

(4) A rectangular shape of international orange with white center will indicate information, other than a danger, control or restriction, which may contribute to health, safety or well-being. The message will be presented within the rectangle in black letters.

(c) Letters or Numbers on Waterway Markers.

(1) Numbers, letters or words on a state aid to navigation or regulatory marker shall be placed in a manner to enable them to be clearly visible to an approaching or passing vessel. They shall be block style, well proportioned and as large as the available space permits. Numbers and letters on red or black backgrounds shall be white; numbers and letters on white backgrounds shall be black.

(2) State aids to navigation shall be numbered or lettered for identification. Red buoys and signs marking channels shall be identified with even numbers, and green buoys and signs marking channels shall be identified with odd numbers, the numbers increasing from the main water body or proceeding upstream. Buoys and signs indicating the center of a waterway or a channel junction shall be identified by letters of the alphabet. All numbers and letters used to identify state aids to navigation shall be preceded by the letters "CF."

(d) Reflectorized Material. Where reflectorized materials are used, a red reflector will be used on a red buoy, a green reflector on a green buoy, and white reflectors only will be used on all other waterway markers, except that orange reflectors may be used on orange portions of regulatory markers, and yellow reflectors may be used on Special Markers, as defined in Section 7002.1.

NOTE: Authority cited: Section 659, Harbors and Navigation Code. Reference: Sections 650 and 659, Harbors and Navigation Code.

7002.1. Special Markers.

Special markers are not primarily intended to assist navigation, but are used to indicate a special area or feature (i.e., traffic separation, anchorage areas, dredging, fish net areas, etc.) whose nature may be apparent from reference to a chart or other nautical document.

(a) Aids used to mark these areas or systems will be all yellow.

NOTE: Authority cited: Section 659, Harbors and Navigation Code. Reference: Sections 650, 655.3, and 659, Harbors and Navigation Code.

7003. Authority to Place Markers.

(a) No waterway marker shall be placed on, in, or near the waters of the State unless such placement is authorized by the agency or political subdivision of the State having power to give such authorization, except that the provisions of this section shall not apply to private aids to navigation under the jurisdiction of the U.S. Coast Guard.

(b) Such agency or political subdivision of the State will, prior to authorizing placement, obtain the necessary clearances of any federal and state agencies concerned. Nothing herein contained shall be construed to require such prior clearance with the Department.

(c) The agency or political subdivision of the State authorizing the placement of a waterway marker will inform the Department of the following:

(1) Exact location of the marker, expressed in latitude and longitude, or in distance and direction from one or more fixed objects whose precise location is known.

(2) The description and purpose of the marker, including its identifying number, if any, as required by Section 7002(a)(5), above.

NOTE: Authority cited: Section 659, Harbors and Navigation Code. Reference: Sections 650 and 659, Harbors and Navigation Code.

7004. Maintenance of Waterway Markers.

Waterway markers shall be maintained in proper condition, or be replaced or removed.

NOTE: Authority cited: Section 659, Harbors and Navigation Code. Reference: Sections 650 and 659, Harbors and Navigation Code.

7005. Display of Waterway Markers.

(a) A waterway marker may be displayed as a sign on a fixed support, as a buoy bearing a symbol on its surface, or as a sign mounted on a buoy.

(b) When a buoy is used to carry a symbol on its surface, it will be white, with a band of international orange at the top and a band of international orange above the water line at the bottom.

(c) A buoy whose sole purpose is to carry a sign above it will be marked with three bands of international orange alternating with two bands of white, each band occupying approximately one-fifth of the total area of the buoy above the water line, except where the sign itself carries orange bands; however, nothing in these regulations will be construed to prohibit the mounting of a sign on a buoy which has been placed for a purpose other than that of carrying a sign.

(d) When symbols are placed on signs, a suitable white background may be used outside the symbol.

NOTE: Authority cited: Section 659, Harbors and Navigation Code. Reference: Sections 650 and 659, Harbors and Navigation Code.

7006. Specifications for Waterway Markers.

(a) The size, shape, material, and construction of all markers, both fixed and floating, shall be such as to be observable under normal conditions of visibility at a distance such that the significance of the marker or aid will be recognizable in time to avoid danger.

(b) Waterway markers shall be made of materials which will retain, despite weather and other exposures, the characteristics essential to their basic significance, such as color, shape, legibility and position.

NOTE: Authority cited: Section 659, Harbors and Navigation Code. Reference: Sections 650 and 659, Harbors and Navigation Code.

7007. Other Waterway Marking Devices.

(a) Mooring Buoys. In order that mooring buoys shall not be mistaken for aids to navigation or regulatory markers, they shall be white, with a blue band clearly visible above the waterline.

(b) Placement of markers such as mooring buoys and permanent race course markers will be processed in the same manner as waterway markers.

(c) Such markers shall not be of a color, shape, configuration or marking which could result in their confusion with any federal or state aid to navigation or any state regulatory marker, and shall not be placed where they will obstruct navigation, cause confusion, or constitute a hazard.

NOTE: Authority cited: Section 659, Harbors and Navigation Code. Reference: Sections 650 and 659, Harbors and Navigation Code.

7008. The Divers Flag.

(a) A red flag with a white diagonal running from the upper left hand corner to the lower right hand corner (from masthead to lower outside corner) and known as the "Divers Flag" shall when displayed on the water, indicate the presence of a person engaged in diving in the water in the immediate area.

(b) Recognition of this flag by regulation will not be construed as conferring any rights or privileges on its users, and its presence in a water area will not be construed in itself as restricting the use of the water area so marked.

(c) Operators of vessels will, however, exercise precaution commensurate with conditions indicated.

(d) This flag may be displayed only when diving is in progress, and its display in a water area when no diving is in progress is that area will constitute a violation of the regulation and of section 659 of the Harbors and Navigation Code.

(e) Nothing in this section will require the carriage of a divers flag for any purpose.

NOTE: Authority cited: Section 659, Harbors and Navigation Code. Reference: Sections 650, and 659, Harbors and Navigation Code.

7009. The Ski Flag.

(a) A red or orange flag measuring no less than 12 inches on each side, in the shape of a square or rectangle, mounted or displayed in such a manner as to be visible from every direction shall be known as a ski flag.

(b) The use of this flag will not be construed as conferring any rights or privileges on its users, and its display will not be construed in itself as restricting the use of the water in the vicinity of the vessel displaying the flag.

(c) Operators of vessels will, however, exercise precaution commensurate with conditions indicated.

(d) The ski flag shall be displayed when one or more of the following conditions exists:

(1) A downed skier.
(2) A skier in the water preparing to ski.
(3) A ski line extended from the vessel.
(4) A ski in the water in the vicinity of the vessel.

The ski flag shall not be displayed at any other time.

NOTE: Authority cited: Sections 652, 658, 658.7 and 659, Harbors and Navigation Code. Reference: Sections 650, 655.3, 658.7 and 659, Harbors and Navigation Code.

Article 7. For Hire Vessel Operator's License

7500. Definitions.

(a) As used in Article 2, (commencing with Section 760) Chapter 5 of Division 3, Harbors and Navigation Code, the terms "carrying more than three passengers for hire" and "carrying passengers for hire" mean the carriage of more than three persons by a vessel for a valuable consideration, whether directly or indirectly flowing to the owner, charterer, operator, agent or any other person interested in the vessel.

(b) "Passenger" means every person, other than the master and a member of the crew or other persons employed or engaged in any capacity on board a vessel in the business of that vessel.

(c) "Department" means the Department of Boating and Waterways.

NOTE: Authority cited: Section 770, Harbors and Navigation Code. Reference: Section 760, Harbors and Navigation Code.

7501. Requirements for Examination.

(a) Prior to the issuance of a For-Hire Vessel Operator's License, every applicant shall meet the following requirements:

(1) Have attained the age of eighteen (18) years.

(2) Show evidence of at least one year's experience in operating the type of motorboat or motor vessel for which the applicant requests license to operate, on the type of water for which applicant requests license to operate.

(A) (Reserved)

(B) Other experience or training, which in the judgment of the Department is a reasonable equivalent, may be substituted.

(3) Furnish information to the Department on forms provided by the Department regarding the following:

(A) Name, address, date and place of birth, and description of applicant.

(B) Type of vessel the applicant requests license to operate.

(C) Waters on which applicant requests license to operate.

(D) Statement as to physical defects.

(E) Statement of experience and training in vessel operation.

(F) Certified statements regarding applicant's boat handling ability and moral character from three persons having knowledge of these matters but who are not members of the applicant's family.

(G) Certification of the truth of the statements submitted in his application.

(e) A violation of this section is a infraction punishable as provided in subdivision (a) of Section 668.

658.5. Age limitations. (a) Any person who permits any other person under 12 years of age to operate any of the following is guilty of an infraction:

(1) A motorboat engaged in towing a person on water skis, an aquaplane, or similar device.

(2) A motorboat designed to carry only one person.

(3) A motorboat propelled by machinery having an aggregate of more than 10 horsepower without the supervision of a person 18 years of age or older aboard the motorboat, except for a dinghy used directly between a moored vessel and the shoreline, and return.

(b) Any person under 12 years of age who operates any motorboat, when prohibited under subdivision (a), is guilty of an infraction.

658.7. Ski flag. (a) Failure of the operator of a vessel involved in towing a skier to display or cause to be displayed a ski flag, as described in subdivision (a) of Section 7009 of Title 14 of the California Code of Regulations, to indicate any of the following conditions, is an infraction punishable by a fine not exceeding fifteen dollars ($15):

(1) A downed skier.

(2) A skier in the water preparing to ski.

(3) A ski line extended from the vessel.

(4) A ski in the water in the vicinity of the vessel.

(b) Subdivision (a) does not apply to a performer engaged in a professional exhibition or a person engaged in a regatta, vessel or water ski race or competition, or other marine event authorized pursuant to Section 268.

659. Uniform navigational marking of waters. The department may make rules and regulations for the uniform navigational marking of the waters of this state. Such rules and regulations shall not be in conflict with markings prescribed by the United States Coast Guard. No city, county, or person shall mark the waters of this state in any manner in conflict with the markings prescribed by the department.

660. Application of chapter to all waters; local boating regulations. (a) Any ordinance, law, regulation, or rule relating to vessels, which is adopted pursuant to provisions of law other than this chapter by any entity other than the department, including but not limited to any county, city, port authority, district, or any state agency other than the department shall, notwithstanding any other provision of law, pertain only to time-of-day restrictions, speed zones, special-use areas, and sanitation and pollution control, and the measure shall not conflict with this chapter or the regulations adopted by the department. Except as provided in subdivision (c), any measure relating to boats or vessels adopted by any governmental entity other than the department shall be submitted to the department prior to adoption and at least 30 days prior to the effective date thereof.

(b) The department may make special rules and regulations governing the use of boats or vessels on any body of water within the territorial limits of two or more counties, cities, or other political subdivisions if no special rules or regulations exist or if the department determines that the local laws regulating the use of boats or vessels on that body of water is not uniform and that uniformity is practicable and necessary.

(c) (1) Any entity, including but not limited to any county, city, port authority, district, or state agency, otherwise authorized by law to adopt measures governing the use and equipment, and matters relating thereto, of boats or vessels, may adopt emergency rules and regulations which are not in conflict with the general laws of the state relating to boats and vessels using any waters within the jurisdiction of the entity if those emergency rules and regulations are required to insure the safety of persons and property because of disaster or other public calamity.

(2) The emergency rules and regulations adopted under paragraph (1) shall become effective immediately upon adoption and may remain in effect for not to

More

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exceed 60 days thereafter. The emergency rules and regulations shall be submitted to the department on or before their adoption.

(3) After submission of emergency rules and regulations adopted pursuant to paragraph (1) to the department, the department may authorize the adopting entity to make the emergency rules and regulations effective for the period of time greater than 60 days that is necessary in view of the disaster or circumstances.

661. Limitation of liability of owner of a numbered vessel. (a) Every owner of an undocumented vessel numbered under this code is liable and responsible for the death of or injury to person or property resulting from negligence in the operation of such vessel, in the business of the owner or otherwise, by any person using and operating the same with the permission, express or implied, of the owner, and the negligence of such person shall be imputed to the owner for all purposes of civil damage. It shall be presumed that such vessel is being operated with the knowledge and consent of the owner if at the time of the injury, death or damage it is under the control of his or her spouse, father, mother, brother, sister, son, daughter, or other immediate member of the owner's family. Nothing contained in this chapter shall be construed to relieve any person from any liability which he would otherwise have, but nothing contained in this chapter shall be construed to authorize or permit any recovery in excess of injury or damage actually incurred.

(b) The liability of an owner for imputed negligence imposed by this section and not arising through the relationship of principal and agent or master and servant is limited to the amount of ten thousand dollars ($10,000) for the death of or injury to one person in any one accident and, subject to the limit as to one person, is limited to the amount of twenty thousand dollars ($20,000) for the death of or injury to more than one person in any one accident and is limited to the amount of ten thousand dollars ($10,000) for damage to property of others in any one accident.

(c) In any action against an owner on account of imputed negligence as imposed by this section the operator of the vessel whose negligence is imputed to the owner shall be made a party defendant if personal service of process can be had upon the operator within this State. Upon recovery of judgment, recourse shall first be had against the property of the operator so served.

(d) If there is recovery under this section against an owner based on imputed negligence, the owner is subrogated to all the rights of the person injured or whose property has been injured and may recover from the operator the total amount of any judgment and costs recovered against the owner.

(e) If the bailee of an owner with the permission, expressed or implied, of the owner permits another to operate the vessel of the owner, then the bailee and such operator shall both be deemed operators of the vessel of the owner within the meaning of subdivisions (c) and (d) of this section.

(f) Where two or more persons are injured or killed in one accident, the owner may settle and pay any bona fide claims for damages arising out of personal injuries or death, whether reduced to judgment or not, and the payments shall diminish to the extent thereof the owner's total liability on account of the accident. Payments aggregating the full sum of twenty thousand dollars ($20,000) shall extinguish all liability of the owner for death or personal injury arising out of the accident which exists by reason of imputed negligence, pursuant to this section, and did not arise through the negligence of the owner nor through the relationship of prinicipal and agent or master and servant.

(g) If a vessel is sold under a contract of conditional sale whereby the title to such vessel remains in the vendor, such vendor or his assignee shall not be deemed an owner within the provisions of this section relating to imputed negligence, but the vendee or his assignee shall be deemed the owner notwithstanding the terms of such contract, until the vendor or his assignee retakes possession of the vessel. A chattel mortgagee of a vessel out of possession is not an owner within the provisions of this section relating to imputed negligence.

(h) No action based on imputed negligence under this section shall abate by reason of the death of any injured person or of any person liable or responsible under

the provisions of this section. In any action for physical injury based on imputed negligence under this section by the executor, administrator, or personal representative of any deceased person, the damages recoverable shall be the same as those recoverable under Section 956 of the Civil Code.

662. Filing of local boating regulations. A copy of the ordinances or local laws adopted pursuant to this chapter, and of any amendments thereto, shall be filed in the office of the department.

663. Enforcement by peace officers; authority to stop and board vessels. Every peace officer of this state or of any city, county, city and county, or other political subdivision of the state shall enforce this chapter and any regulations adopted by the department pursuant to this chapter and in the exercise of that duty shall have the authority to stop and board any vessel subject to this chapter, where the peace officer has probable cause to believe that a violation of state law or regulations or local ordinance exists.

663.1. Arrest without warrant. Notwithstanding any other provision of law, a peace officer may, without a warrant, arrest a person who is involved in an accident in the waters of this state involving a vessel when the officer has reasonable cause to believe that the person had been operating the vessel while under the influence of an alcoholic beverage or any drug, or under the combined influence of an alcoholic beverage and any drug.

663.5. Enforcement by harbor policemen; marking of police vessels. Within the territorial limits of a county, city, or district, a harbor policeman regularly employed and paid as such by the county, city, or district shall also enforce the provisions of this chapter and any rules or regulations adopted by the department pursuant to this chapter and the provisions of Chapter 2 (commencing with Section 9850) of Division 3.5 of the Vehicle Code.

In the exercise of his duties, a harbor policeman shall have the authority to stop any vessel subject to this chapter and to issue written notices to appear in court pursuant to Section 664. As used in Section 664, the term "officer" shall include a harbor policeman regularly employed and paid as such by a county, city, or district.

Every harbor policeman who is on duty for the purpose of enforcing the provisions of this chapter, and the rules and regulations adopted by the department pursuant to this chapter, shall wear a full distinctive uniform, and, if he uses a vessel, the vessel shall be painted a distinctive color and appropriately marked as specified by the department to identify it as a harbor police vessel.

663.6. Vessel shall stop on lawful order. Every vessel subject to this chapter, if under way and lawfully ordered to stop and lie to by a peace officer or harbor policeman authorized to enforce the provisions of this chapter who is either in a uniform of a law enforcement agency or the harbor police or in a vessel that is distinctly marked as belonging to a law enforcement agency or to the harbor police, shall stop immediately and lie to, or shall maneuver in such a way as to permit the peace officer or harbor police vessel to come alongside.

663.7. Boating safety and enforcement aid program. (a) Each county of the state is entitled to receive state financial aid for boating safety and enforcement programs on waters under its jurisdiction as provided in this section. A boating safety and enforcement program, as used in this section, includes search and rescue operations, recovery of drowned bodies, enforcement of state and local measures for regulation of boating activities, inspection of vessels, and supervision of organized water events.

(b) An entity other than a county, including the Department of Parks and Recreation, is entitled to receive aid for boating safety and enforcement programs on waters under its jurisdiction through the county in which it lies, and that aid shall be counted as aid to such county; except that aid provided under subdivision (d) for boating safety and enforcement programs of the Department of Parks and Recreation for waters under its jurisdiction shall not be counted as aid to a county.

California Department of Boating and Waterways

B2-1. Safety measures used to warn boaters of construction activities were described under Mitigation Measure L-2 in Chapter 3L of the 1995 DEIR/EIS. The discussion has been changed to include language regarding Section 7000 *et seq*. of the California Code of Regulations. The first sentence under Mitigation Measure L-2 has been revised as follows in Chapter 3L in FEIS Volume I:

> The construction contractor shall ensure that the barge is well marked and lit in accordance with Title 14 of the California Code of Regulations, Section 7000 *et seq.*

B2-2. Potential safety problems and mitigation measures for waterways surrounding the Delta Wetlands Project islands were discussed under "Waterway Traffic and Safety" in Chapter 3L of the 1995 DEIR/EIS. As mentioned in Chapter 3L, boats traveling within 200 yards upstream or downstream of boat docks are required to maintain a speed of 5 miles per hour. This state-enacted requirement is pursuant to Section 655.2(2)(C) of the California Harbors and Navigation Code. If a local government agency (e.g., Contra Costa or San Joaquin County marine patrol) determines that other waterway areas are affected by the Delta Wetlands Project and require enactment of speed restrictions or any other law, ordinance, or regulation pertaining to waterway use, the local agency would submit any such measures to the California Department of Boating and Waterways before adopting them and at least 30 days before the measures would become effective (Section 660(c), California Harbors and Navigation Code). Additionally, any waterway markers placed in, on, or near the water to convey an official message to a boat operator must conform to the uniform Waterway Marking System standards as adopted by the California Department of Boating and Waterways (Sotelo pers. comm.).

The text of Chapter 3L has been changed to include language regarding Sections 660 and 662 of the California Harbors and Navigation Code. Mitigation Measure L-3 has been revised to conclude with the following sentence:

> Regulations for boating activities proposed by local agencies must be submitted to, reviewed, and approved by the California Department of Boating and Waterways in accordance with the California Harbors and Navigation Code before they are adopted and implemented.

B2-3. The use of the Bouldin Island airstrip under the proposed Delta Wetlands Project was discussed in the 1995 DEIR/EIS under "Recreation Facilities" in Chapter 2 (page 2-13 in Chapter 2 of FEIS Volume 1) and"Air Traffic from Bouldin Island" on page 3L-13 of the 1995 DEIR/EIS (page 3L-15 in Chapter 3L of FEIS Volume 1). Use of the airstrip under existing conditions was described under "Air Traffic from Bouldin Island" on page 3L-4 of the 1995 DEIR/EIS (see page 3L-5 in Chapter 3L of FEIS Volume 1) . The airstrip is currently used for agricultural operations and would continue to be used in a limited capacity. The estimated number of flights (takeoffs and landings) generated by the Delta Wetlands Project would be less than the current number of flights generated during agricultural activities. The effect of air traffic on wind-propelled or small paddle crafts therefore would not be significant.

1 November 1995 File No.: 95-MC-7 **Letter B3**

re: Draft EIR/EIS Delta Wetlands Project JES

Dear Mr. Sutton:

Our office has no additional comment on the above referenced document. However, thank you for your continued concern for protecting cultural resources. **B3-1**

Sincerely,

Leigh Jordan

Leigh Jordan

Assistant Coordinator

NORTHWEST INFORMATION CENTER
OF THE HISTORICAL RESOURCES
INFORMATION SYSTEM
Sonoma State University
1801 East Cotati Avenue, Bldg. 300
Rohnert Park, CA 94928-3609

STATE WATER RESOURCES CONTROL
BOARD
DIVISION OF WATER RIGHTS
ATTN JIM SUTTON
PO BOX 2000
SACRAMENTO CA 95812-2000

Northwest Information Center of the Historical Resources Information System

B3-1. Chapter 3M, "Cultural Resources", addresses potential impacts and identifies mitigation measures for archeological and historic resources on the Delta Wetlands Project islands.

Letter B4

STATE OF CALIFORNIA—THE RESOURCES AGENCY

PETE WILSON, *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

November 9, 1995

Mr. Jim Sutton
Division of Water Rights
State Water Resources Control Board
Post Office Box 2000
Sacramento, California 95818-2000

Mr. Jim Monroe
Regulatory Branch
U.S. Army Corps of Engineers
1325 J Street, 14th Floor
Sacramento, California 95814

The Department of Water Resources requests a time extension, until January 10, 1996, for review of the Delta Wetlands Draft Environmental Impact Report/Environmental Impact Statement. The draft is lengthy and complex, and some of the most important conclusions are based upon mathematical modeling work that needs to be evaluated in detail.

B4-1

While it would be possible to meet the current November 21, 1995 comment deadline, the comments of the Department of Water Resources would, necessarily, be based on a less thorough evaluation than if an extension is granted. We feel an extension would be in the best interests of all involved parties, as it may enable a number of concerns to be resolved which would otherwise have to be the subject of EIR comments.

In the event it is decided that an extension of the comment period is in order, I would appreciate being notified at your earliest convenience. My telephone number is (916) 327-1636. Thank you for your consideration.

Sincerely,

Rick Woodard
Staff Water Quality Specialist
Division of Local Assistance

California Department of Water Resources

B4-1. The SWRCB and USACE extended the comment period by 30 days (to December 21, 1995) in response to this and other requests.

Letter B5

STATE OF CALIFORNIA

PETE WILSON, *Governor*

CALIFORNIA STATE
LANDS COMMISSION

GRAY DAVIS, *Lieutenant Governor*
KATHLEEN CONNELL, *Controller*
RUSSELL S. GOULD, *Director of Finance*

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November 21, 1995

File Ref.:SD95-09-14.1

Mr. James Burroughs
State Projects Coordinator
The Resources Agency
Attention: Nadell Gayou
1416 Ninth Street, Room 1311
Sacramento, CA 95814

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
P. O. Box 2000
Sacramento, CA 95812-2000

U. S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1325 J Street, Room 1444
Sacramento, CA 95814-2922

Dear Mr. Burroughs, Mr. Sutton and Mr. Monroe:

Staff of the State Lands Commission (SLC) has reviewed the Draft Environmental Impact Report/Environmental Impact Statement (DEIR/S) for the Delta Wetlands Project, SCH No. 95093022. Based on this review, we offer the following comments.

Jurisdiction

The proposed project directly involves state-owned sovereign lands under the jurisdiction of the SLC, including, but not limited to, the San Joaquin, Mokelumne, False, Old and Middle Rivers, and Sandmound and Potato Sloughs. Placement of structures on any state-owned lands in the beds of tidal and navigable waterways requires a lease from the SLC, and thus the SLC is a Responsible Agency for this project. Examples of such structures within the proposed project include boat docks on the channel side of the island levees, or any rock slope protection which extends below the ordinary high water mark. As noted in the DEIR/S, dredging on sovereign lands is also under SLC jurisdiction and requires SLC authorization.

All sovereign lands are held by the State subject to the public trust doctrine, and therefore the SLC is a Trustee Agency for the proposed project, along with being a Responsible Agency. In addition, the SLC is also Trustee Agency for any sovereign lands of the larger San Francisco Bay/ Delta region which would be indirectly affected by this project. Indirect effects of the project which have the potential of adversely impacting public trust resources include: erosion of channel islands, berms or levees from boat wakes or alterations in flows; localized scour of channels from diversion or discharge from islands; alterations of aquatic habitat through changes in delta flow patterns, temperature, and salinity; disturbance of wildlife by increased recreational boaters; and diminishment of recreational enjoyment or navigation by increased boat congestion resulting from the project.

The California Environmental Quality Act (CEQA) requires that such impacts to public trust resources as named above be addressed in the EIR/S. Additionally, pursuant to *National Audubon v. Superior Court*, 33 Cal.3d 419 (1983), the State Water Resources Control Board, when ruling on water rights applications, is required to evaluate the effects of the proposed appropriation on public trust resources and to protect them whenever feasible. The DEIR/S would be an appropriate and convenient forum in which to discuss this issue.

Comments on Environmental Analysis

General

The primary focus of the DEIR/S is on impacts to island interiors, their land use and habitats, and on Delta water quality and overall Delta channel flow patterns. We are concerned about the inadequate analysis in the DEIR/S of other impacts which occur on the water or channel side of the levees, such as loss or disturbance to emergent marsh or other intertidal or subtidal physical habitats and increased boat traffic congestion and hazards. **B5-1** Additionally, the DEIR/S does not adequately address the issue of sewage disposal, both from dock usage and from the land side recreational facilities. **B5-2**

Another major concern is that the DEIR/S does not discuss project inconsistencies with the Delta Protection Commission's (DPC) *Land Use and Resource Management Plan for the Primary Zone of the Delta,* which was adopted February 23, 1995, pursuant to the Delta Protection Act of 1992. This discussion is required by the CEQA guidelines, § 15125 (b) and (c). **B5-3**

Specific

1. There are some elements of the project description which are not clear. Drawings which depict the siphon and pump stations, Figures 2-1 and 2-4, Appendix 2, show 10 boat **B5-4**

docks at each station. Each potential reservoir island could have 30 additional berths. These docks do not appear to have been considered with the impacts of the other docks associated with the recreational facilities. **B5-4 cont'd**

2. There is no description of the environmental setting for any waterside or channel habitats, either at the specific vicinity of the proposed structures, or within the general region. Regional habitats should be addressed because of the project-related impacts due to boat wake erosion and disturbance by noise, trampling, dumping and related activities from the increased numbers of recreational boaters. The habitat descriptions should be added to the sections on vegetation and wetlands, wildlife, and fishery issues, with cross references in recreation and aesthetics. **B5-5**

   Channel habitats of significance which could be affected by the project include emergent wetland vegetation, woody riparian vegetation, intertidal flats, and subtidal shoals with or without submerged vegetation. In addition to their importance to overall Delta ecosystem health, these habitats support a number of special status plants and animals which should be discussed.

3. Impacts resulting directly from the placement and operation of channel side facilities, such as pilings, docks, rock slope protection, water pipes, and siphons were not evaluated. Potential for such impacts is recognized in the DEIR/S, but in place of analysis for aquatic habitats, the DEIR/S has Mitigation Measure F-1, p. 3F-15. This measure requires that the applicant submit to Department of Fish and Game (DFG) and the Fish and Wildlife Service (USFWS) a habitat characterization map of the channel sites which could be directly affected by the project, and then "implement a fish habitat replacement plan". The text does not specify that any lead agency approval is required for this replacement plan. **B5-6**

   Deferring the impact analysis to a later date, outside of the DEIR/S process; allowing the project applicant to do the analysis; and deferring approval of the analysis to other agencies, specifically the DFG and the USFWS, violates several well-established principles of CEQA: 1) environmental review must be done at the earliest feasible stage, 2) commenting agencies and the public are entitled to a meaningful review of the environmental analysis and 3) the environmental analysis must be done directly by, or under contract to, the lead agency (See *Sunsdtrom v . County of Mendocino,*(1988) 202 Cal.App.3d 296 [248 Cal. Rptr.352] and *Citizens for Quality Growth v. City of Mount Shasta,* (1988) 198 Cal.App.3d 433 [243 Cal Rptr.727].

4. The DEIR/S does not adequately address impacts due to increased boating traffic. First, there is no evaluation of impacts of erosion due to boat wakes on channel habitats, as **B5-7**

mentioned previously, or on levee security. Second, the impacts on congestion appear to be underestimated. **B5-7 cont'd**

The methodology used to estimate impacts on boater safety and recreational congestion is not justified. The DEIR/S analysis looks at the Delta as a whole, not the likely affected environment in the vicinity. Also, there is no explanation of how the numbers of boat registrations relates to intensity of boating use, and thus boating impacts, for the project area. By contrast, the EIR for the Willow Berm Marina Expansion (SCH 940120510), located near the confluence of the Mokelumne and San Joaquin Rivers, contained a detailed analysis relating number of berths and to boating activity in the affected vicinity. The Willow Berm project was to add 95 berths to 220 existing berths. The proposed Delta Wetlands project would add 1,140 (30 x 38) new berths in the central Delta, overlapping with some of the same area analyzed in the Willow Berm Marina document. **B5-8**

To estimate impacts on traffic, the DEIR/S, p.3J-13, used percent of total boat registrations and percent of total Delta boater user days to arrive at impacts. We believe an analysis using similar methodology as in the study done for the Willow Berm Expansion be done to address the impacts in specific local channels, which would give a more realistic estimate of impacts. Cumulative impacts should be addressed in more detail as well.

5. The effects of pollutants from boating activities is underestimated. The DEIR/S, page 3C-36 appears to base pollutant impacts on the same methodology as was used for estimating boat traffic impacts — percent Delta-wide registrations and recreation user-days. This will not address the impacts on water quality which would be expected to be more concentrated in the immediate vicinity of the docks and the channels likely to be used for travel or destination. **B5-9**

6. The disposal of sewage from boats and from the proposed recreational facilities are poorly addressed. The DEIR/S main volume does not propose any boat pump-out facilities, either in the project description, or as mitigation (see pp. 3C-36,37). However, additional pumpout facilities were suggested as a mitigation measure in Appendix C6, page 12. This should be brought forth to the main document.

The project proposes to add recreational overnight facilities for up to 3,040 (38 x 80) people. The DEIR/S does not disclose how sewage disposal would be accomplished, but instead provides Mitigation Measure E-7: "Obtain Appropriate Local and State Permits for Recreation Facility Services and Utilities". No evidence has been presented that sewage disposal for this many people, in addition to the numbers using the boat docking **B5-10**

facilities, could feasibly be handled, particularly in light of adopted policy P-3 in the DPC 1995 Plan, cited above. This policy states: "New sewage treatment facilities (including storage ponds) and areas for disposal of sewage effluent and sewage sludge shall not be located within the Delta Primary Zone". As discussed in Comment 3. above, CEQA requires that mitigation measures be addressed by the lead agency within the EIR review, not deferred to a later date or to another agency. **B5-10 cont'd**

7. The evaluation of scour and other effects when pipes are discharging or taking up water is not clearly explained. Given the high flow rates of water movement, especially at discharge arrays (up to 3,000cfs at each location) we are concerned about the potential effects of scour on the bottom and on habitats immediately adjacent to discharges. We are also concerned about impacts to boater safety around pipe ends. We suggest floating booms in addition to warning signs and pilings. **B5-11**

Thank you for your consideration of these comments. If you have any questions, please contact Diana Jacobs at (916) 574-1877.

Sincerely,

Dwight E. Sanders

Dwight E. Sanders
Chief, Division of Environmental
Planning and Management

cc: Robert C. Hight
William Morrison
Jane Sekelsky
Mary Griggs
Diana Jacobs

California State Lands Commission

B5-1. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

B5-2. As stated in response to Comment A3-3, the governing counties, which are responsible agencies in the CEQA process, have been consulted regarding the requirements for issuing permits for sewage facilities on the Delta Wetlands Project islands. Based on these discussions, more information has been added to Mitigation Measure E-7 (see response to Comment A3-3). The 1995 DEIR/EIS analyzes the impacts of constructing recreation facilities and the need for additional sewage disposal facilities (see Chapter 3E, "Utilities and Highways"). If, when specific design details are submitted, a regulating agency determines that the NEPA and CEQA documentation already prepared for the project does not cover site-specific environmental impacts in enough detail, the agency may require additional environmental documentation before approving permits, entitlements, or alternative sewage treatment methods.

Approval of the Delta Wetlands Project recreation facilities would be conditioned specifically on implementation of Mitigation Measure E-7; if Mitigation Measure E-7 were not implemented, the recreation facilities would not be built and the impact would not occur. Therefore, no additional mitigation would be necessary if permit requirements for the county are met. See response to Comment A3-3 for more information.

B5-3. The Delta Protection Commission's comment letter (see comment letter B1) states: "The environmental documents prepared regarding this project do indicate that the project is located in the Primary Zone of the Delta and include the analysis required by local governments [to make required findings under the Delta Protection Act]".

As described in Chapter 3I, "Land Use and Agriculture", water storage on the Delta Wetlands Project islands is consistent with the intent of the Delta Protection Act. In response to this comment, an analysis has been completed to examine the Delta Wetlands Project's consistency with the goals of the Delta Protection Commission's Land Use and Resource Management Plan for the Primary Zone of the Delta. See response to Comment B1-1.

B5-4. The boat docks at siphon and pump stations would be used to provide access for maintenance workers and equipment only. These docks would not be used for docking of recreational boats or for permanent docking, so the assessment of recreational boat use and associated impacts does not include an assessment of these boat slips. The siphon and pump stations would not generate new boat traffic. Additionally, maintenance activity would rarely coincide with peak recreational boat-use periods (e.g., summer weekends).

B5-5. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

B5-6. The potential effects of the Delta Wetlands Project on aquatic habitat, including the placement and operation of pilings, docks, and diversion and discharge facilities, are addressed by the USFWS, NMFS, and DFG biological opinions on the project. See "Alteration of Habitat" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions". The terms of the biological opinions replace the mitigation previously identified in the 1995 DEIR/EIS. See also response to Comment B7-64 regarding predation at recreation facilities and Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities", regarding potential impacts resulting from recreation use associated with the proposed project.

B5-7. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

B5-8. Boat traffic generated by the Delta Wetlands Project is analyzed in Chapter 3L, "Traffic and Navigation". The analysis of boat traffic focuses on the effects on the Delta as a whole because the Delta Wetlands Project would affect boat traffic in a large area; however, the document recognizes that effects of boat traffic would be concentrated around the Delta Wetlands Project islands and adjacent areas. The boating activity generated by the Delta Wetlands Project would be concentrated in the vicinity of the four Delta Wetlands Project islands, as described under Impact L-7, "Increase in Boat Traffic and Congestion on Delta Waterways during Delta Wetlands Project Operation". The adverse effect that the Delta Wetlands Project would have on boating conditions both in channels adjacent to project islands and in the Delta as a whole is identified as a significant and unavoidable impact.

The California Department of Boating and Waterways provided boat registration numbers for both Contra Costa and San Joaquin Counties because formal regional boat counts are not conducted regularly in the Delta. Although boat registration figures cannot be directly linked to intensity of boat use, the number of registered boats in the Delta counties provides a relative estimate of boat use in the Delta area and project vicinity.

The methodology for analyzing boat use presented in the 1995 DEIR/EIS on the Delta Wetlands Project is consistent with the result of the analysis presented in the EIR for the Willow Berm Marina expansion use permit (County of Sacramento 1995). Sacramento County conducted a detailed study of boat use within 6 miles of the Willow Berm Marina. The Willow Berm Marina EIR estimated peak summer boat use based on information obtained from discussions with local harbor masters, sheriff patrols, and the U.S. Coast Guard (see Appendix E in the Willow Berm Marina final EIR). Based on those conversations, the county determined that approximately 50% of all boats berthed in the study area (occupied berths) could be expected to be in use on a peak summer holiday such as Labor Day. To be conservative, the county assumed that all available berths were occupied; the resulting estimate of peak boat use was 50% of the total available berths. The estimates for the Delta Wetlands Project analysis were also based on discussions with local marina operators; results of the analysis were similar to the results presented in the Willow Berm Marina EIR. The Delta Wetlands Project analysis assumed that 70% of the

available berths would be occupied and that 70% of all boats berthed would be used on a peak day; these assumptions result in peak boat use estimated at 49% of the total available berths.

The Willow Berm Marina study also evaluated peak boat densities in the adjacent channels to indicate adverse effects on boater safety and boat traffic congestion. Although a detailed boat density analysis was not done for the Delta Wetlands Project, the 1995 DEIR/EIS recognizes that implementation of the Delta Wetlands Project would "adversely affect boating safety on Delta waterways by increasing boat traffic, contributing to congestion, and adversely affecting navigation during construction". The 1995 DEIR/EIS identifies mitigation measures to reduce the impacts on safety caused by the increase in boat congestion; these measures are consistent with mitigation identified for the Willow Berm Marina project and recommended by the California Department of Boating and Waterways. See Impact L-10 and Mitigation Measure L-3 in the 1995 DEIR/EIS and refer to comment letter B2 from the California Department of Boating and Waterways for more information.

The cumulative effect of the Delta Wetlands Project on boating safety is considered significant and unavoidable. Figure 3J-1 shows the locations of existing marina facilities in the vicinity of the Delta Wetlands Project islands. The boat traffic generated by the Delta Wetlands Project combined with existing boat use from those marinas would produce a significant cumulative effect, as described in the 1995 DEIR/EIS under Impact L-23, "Cumulative Increase in Safety Problems on Delta Waterways".

A mitigation measure to reduce boat traffic has also been recommended and is described in Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

B5-9. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities". Delta Wetlands does not propose to provide pumpout facilities for boats because pumpout facilities are available in the vicinity of the Delta Wetlands Project islands and other locations throughout the Delta, as shown in Figure 3E-4 of Chapter 3E, "Utilities and Highways". In addition, a recreation survey published in 1997 by the Delta Protection Commission indicates that 15% of powerboat owners have pumpout toilets on their vessels (Delta Protection Commission 1997). Of these boats, houseboats are most likely to be equipped with pumpout toilets. The Delta Wetlands boat docks are expected to accommodate the same types of boats presently used throughout the Delta. Therefore, an average of 15% of boats using the Delta Wetlands facilities would be expected to require pumpout facilities. With the reduction in the number of outward boat slips located at the proposed recreation facilities (see Master Response 5) and assuming a 70% occupancy rate, the number of boats that are provided permanent docking space under the proposed project would be 400; of these, approximately 60 may require pumpout facilities. The existing sewage pumpout facilities provided by other marinas in the area are expected to be adequate to serve these boats.

B5-10. See responses to Comments A3-3 and B5-2 for more information regarding mitigation for sewage disposal demands.

Policy P-2 on page 11 of the Delta Protection Commission's Land Use and Resource Management Plan for the Primary Zone of the Delta states the following: "Uses which attract a substantial number of people to one area, including expansions to the Delta communities, recreational facilities, or businesses, shall provide adequate infrastructure improvements or pay to expand existing facilities, and not overburden the existing limited community resources". According to Delta Protection Commission staff, the proposed recreation facilities would be consistent with the Delta Protection Commission plan if Delta resources have been protected and the sewage disposal methods are consistent with county sewage disposal requirements and general plans for both Contra Costa and San Joaquin Counties (Aramburu pers. comm.). Additionally, the Delta Wetlands Project would not be inconsistent with Policy P-3, which is referenced by the commenter, because Delta Wetlands does not propose to add new treatment facilities within the primary zone.

Approval of the recreation facilities under the Delta Wetlands Project would be conditioned specifically on implementation of Mitigation Measure E-7, which requires that the recreation facilities meet county requirements and standards for sewage facilities; if Mitigation Measure E-7 were not implemented, the recreation facilities would not be built.

B5-11. Chapter 3B, "Hydrodynamics", of the 1995 DEIR/EIS includes a discussion of scour and its effects under "Delta Wetlands Reservoir Island Discharge Hydraulics" on page 3B-16 (see page 3B-18 in FEIS Volume 1). Each discharge pump would have a maximum exit flow rate of about 100 cfs, and the expansion chambers would reduce the maximum discharge velocity to about 3.3 fps. Additionally, Delta Wetlands would place riprap on the channel bottom at the discharge locations. Details on pump station design are provided under "Pump Units" on page 2-3 of Appendix 2, "Supplemental Description of the Delta Wetlands Project Alternatives", and Figure 2-5 in Appendix 2 illustrates the plan design for pump stations. Because the water would be discharged horizontally above the channel bottom and the channel would be protected with riprap, discharge flows would not scour the channel bottom once the pump stations are operational and fine sediment materials have been swept away.

Boater safety related to pipe ends is also discussed under "Delta Wetlands Reservoir Island Discharge Hydraulics" on page 3B-16 of the 1995 DEIR/EIS (FEIS page 3B-18). The discharge facilities would be clearly identified with pilings and guards to protect the discharge pipes. Delta Wetlands would post all warning signs and implement other safety measures, such as placement of floating booms, as necessary, under the guidance of the California Department of Boating and Waterways (see comment letter B2). The discharge velocity will decrease rapidly with increasing distance from the discharge facility, and discharges from Delta Wetlands Project islands are not likely to cause any dangerous conditions for boaters.

Letter B6

STATE OF CALIFORNIA—THE RESOURCES AGENCY

PETE WILSON, Governor

DEPARTMENT OF FISH AND GAME
1416 NINTH STREET
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SACRAMENTO, CA 94244-2090
(916) 653-7664

December 20, 1995

Mr. Jim Sutton
California State Water Resources
Control Board
Post Office Box 2000
Sacramento, California 95812-2190

Mr. Jim Monroe
U.S. Army Corps of Engineers
Regulatory Branch
1325 J Street, 14th Floor
Sacramento, California 95814-2922

Dear Messrs. Sutton and Monroe:

Comments on the Delta Wetlands Project Draft Environmental Impact Report/Draft Environmental Impact Statement (DEIR/DEIS) SCH 88020824 Prepared by the State Water Resources Control Board (Board) and the U.S. Army Corps of Engineers (COE), and the COE Public Notice 190109804

The California Department of Fish and Game (Department) has reviewed the Delta Wetlands Project DEIR/DEIS, prepared jointly by the Board and COE, and the COE Public Notice. The Delta Wetlands Project is a proposal by Delta Wetlands (DW) Properties to modify the land uses on four Sacramento-San Joaquin Delta islands and tracts, totaling approximately 21,000 acres; Bacon and Bouldin islands in San Joaquin County and Holland and Webb tracts in Contra Costa County. The currently proposed DW Project represents a substantial modification of a previous proposal described in a DEIR/DEIS released in 1990. DW now proposes to modify the levees and intake and drain facilities on two Delta islands, Bacon Island and Webb Tract, to act as reservoir islands. These islands would be used to store diverted surplus Delta inflows, transferred water, or banked water for later sale and/or release for Delta export or to meet water quality or flow requirements for the San Francisco Bay/Sacramento-San Joaquin Delta (Bay-Delta) Estuary. The reservoir islands, totaling approximately 11,000 acres, would have a combined capacity of 238 thousand acre feet (TAF). During periods of non-storage, the reservoir islands would be managed as shallow water habitat to provide wetland habitat values incidental to the primary water storage functions of the reservoir islands. Revised water rights applications have been filed by the project proponent to allow for diversions to fill the reservoir islands.

DW also proposes to modify the current land uses on two other Delta islands, Bouldin Island and Holland Tract, to be managed as wildlife habitat pursuant to the Habitat Management Plan (HMP) contained in the DEIR/DEIS. Management of the habitat islands, totaling approximately 9,000 acres, would target the State-listed greater sandhill crane and Swainson's hawk, and wintering waterfowl, but would also benefit many other wildlife species. Water released during the course of managing the habitat islands might be sold or used for the same purposes as the water released from the reservoir islands. DW also proposes to construct recreation facilities along the perimeter of all four DW Project islands and to operate a private airstrip on Bouldin Island.

We are reviewing this document as the Public Trust Agency for fish and wildlife in the State of California and as the State fish and wildlife agency under the Fish and Wildlife Coordination Act.

The project, as presently described, avoids significant unmitigated adverse impacts to wintering waterfowl, greater sandhill cranes, Swainson's hawks, wintering and resident raptors, wintering and resident passerine birds, and populations of small mammals. However, the Department believes that the project as currently proposed will result in significant, unmitigated adverse impacts to the State- and Federally-listed winter-run chinook salmon and delta smelt as well as other resident and migratory fish in the Bay-Delta Estuary. **B6-1**

The DEIR/DEIS for the DW Project is generally adequate in its evaluation of significant adverse impacts to wildlife resources. It does include questionable conclusions with respect to impact significance for selected non-listed fish species, impacts associated with recreational facilities, and project-induced hydrodynamic changes that may affect berm islands, shaded riverine aquatic habitat, and shallow shoal habitat.

Operation of the DW Project may result in potential growth inducing impacts due to greater operational flexibility and water supply. Therefore, we believe the DEIR/DEIS should provide an analysis of these potential impacts in the SWP/CVP service area. **B6-2**

The basis of our concerns and specific recommendations to address them are presented in general comments on major sections of the report and in specific comments, annotated by page and paragraph, which are included in Appendix A (attachment). A summary of impacts to wildlife species known to occur in the project area is included in Appendix B (attachment). This summary shows that impacts to birds, mammals, reptiles, and amphibians due to the proposed project are generally offset and for several species ancillary benefits are provided by the project.

We recommend that the Board and the COE, as the lead agencies, incorporate the additional data, analyses, clarifications, and corrections we identify in this letter into the final EIR/EIS. Furthermore, consultation pursuant to the California Endangered Species Act (CESA) and the Federal Endangered Species Act (ESA) should be completed so that the biological opinions of the respective fish and wildlife agencies can be included in the final EIR/EIS. B6-3

The deficiencies noted in our comments should be addressed and remedied in order to comply with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). To avoid jeopardizing the continued existence of several State-listed species in the project area and to minimize incidental take of those listed species as well as reduce significant impacts to other fishery resources to less-than-significant levels, the project modifications described in this letter should be incorporated in the final EIR/EIS. Furthermore, the project modifications and specific mitigation program addressing fishery and service area impacts, in combination with the HMP, should be made terms of the COE permit and the Board water right permit. The Department intends on incorporating these same requirements in its CESA 2081 Memorandum of Understanding and Management Authorization. B6-4

GENERAL COMMENTS
Habitat Management Plan

Overall the HMP contains a balanced, comprehensive program for ensuring that the DW Project avoids any significant impacts to the greater sandhill crane, Swainson's hawk, wintering waterfowl, and other wildlife resources. A beneficial component of the HMP is the continuation of farming on almost one-third of the habitat islands in corn and wheat optimally managed for wildlife. This will provide wildlife benefits and help reduce impacts on the local farming community and related businesses.

The management of Bouldin Island and Holland Tract as specified in the HMP, in conjunction with the management of Bacon Island and Webb Tract as shallow water habitat during non-storage periods, should be inextricably linked to any authorization for DW to proceed with the project. Management of the habitat islands and reservoir islands in this manner is necessary to offset impacts to wintering waterfowl such as the tundra swan. B6-5

We commend the Board and COE for fostering the completion of the HMP included as Appendix G-3 in the DEIR/DEIS. Jones and Stokes Associates staff, on behalf of the Board and COE, contributed a tremendous amount of effort and skill in assembling the HMP. DW should also be recognized for working closely and productively with the Department, other agency staff,

and non-agency waterfowl specialists to complete this plan. The Department looks forward to its oversight role as described in the HMP and intends to incorporate much of the HMP into the CESA 2081 Management Authorization for the DW Project. **B6-5 cont'd**

Project Description

The Department is reviewing the DW Project in the context of the 1995 Water Quality Control Plan (WQCP) and the December 15, 1994 Principles of Agreement (Water Accord). The DEIR/DEIS presents the project from the perspective that the 1995 WQCP objectives such as export limits could be used to define diversion opportunities for projects other than the SWP and CVP. Some parties to the Water Accord, however, view those export limits as applying only to the state and federal water projects and only in the context of the operations studies that indicated to what extent and under what hydrologic conditions the predicted export ratios occurred. This viewpoint requires that the DW Project, therefore, demonstrate that the protection measures provided in the 1995 WQCP and the Water Accord are not compromised. In addition, the DW Project should be implemented in a manner that provides an incremental benefit to the Delta's fishery resources. The Department is committed to continue working with DW, the Board, and COE, to develop measures that will improve conditions in the Delta. **B6-6**

The DEIR/DEIS generally presents a complete and concise project description. However, the project description requires clarification on the inner-levee system of the reservoir islands and on shallow water management during periods of non-storage. An inner-levee system will be constructed on the two reservoir islands. This system will include a series of low height levees and connecting waterways to allow the management of water levels on seasonal wetlands when the reservoir islands are not being used for deep water storage. It will be designed to achieve the required water depth specifications of at least 50 percent having an average depth of 12 inches, up to 15 percent as deep as 24 inches, and no more than 35 percent dry. The inner-levees will be broad earthen structures which can also serve as roadways to assist ground transportation across the islands during dry and seasonal wetland conditions. The inner-levee system's field levees will be constructed and water control structures will be installed so that water can be managed and circulated to maintain water quality, control waterfowl disease outbreaks, and control mosquitos. These clarifications should be made in the final EIR/EIS. **B6-7**

Threatened and Endangered Species and CESA Consultation

As required by CESA, the Department must issue written findings as to whether the proposed project would jeopardize the continued existence, destroy or adversely modify habitat, or result in the taking of State-listed species. The Department will make that written finding at the completion of the CESA 2081 process with the applicant and, as part of its consultation with the Board, in its Biological Opinion pursuant to Section 2090.

The Department believes that information presented on the effects of the proposed project on the State-listed threatened greater sandhill crane and Swainson's hawk, and on measures to avoid or offset these effects is sufficient to comply with CEQA and CESA. The Department also believes that the DEIR/DEIS, particularly the Hydrodynamic chapter and appendix (Chapter 3B and Appendix B-1), the Biological Assessment, and supplemental information and analyses provided to the Department gives us the necessary information to issue written findings for the State- and federally-listed winter-run chinook salmon, delta smelt, and federal candidate Sacramento splittail. We strongly recommend that this supplemental information and these analyses, along with appropriate mitigation measures acceptable to the State and federal fish and wildlife agencies, be compiled into a revised Biological Assessment and included in the final EIR/EIS. Revision of the Biological Assessment is also essential for facilitating CESA/ESA consultation.

B6-8

As presently described, the proposed project may jeopardize the continued existence of the winter-run chinook salmon and delta smelt due to the direct impacts of DW project operations and indirect impacts of CVP/SWP operational changes in the Delta. Additional information should be presented on project alternatives and conservation measures which can eliminate or reduce incidental take and offset unavoidable impacts in order to avoid a jeopardy finding. The Department has been meeting frequently with DW Project proponents as well as U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) staff to address issues related to both State- and federally-listed fish species. These meetings initially focused on whether the Biological Assessment adequately characterized the project and its likely effects on special status fishery resources. These efforts have been productive and, with the capable facilitation of Jones and Stokes Associates staff, have proved useful in reaching agreement that the impact data and analytical assessment tools were adequate. Discussions of potential measures to offset adverse impacts and to provide some incremental improvement in Delta conditions for fish and wildlife are continuing. Measures such as modification of DW Project operations during periods when winter-run chinook salmon, delta smelt, or Sacramento splittail may be impacted; restrictions on other operations that could be adverse to these species, and acquisition and development of suitable shaded riverine aquatic and shallow shoal habitat to replace that lost due to the proposed project are being considered.

Pursuant to Fish and Game Code Section 2095, the Department is participating with the USFWS and the NMFS in consultation with the lead agencies and DW in an effort to develop a Biological Opinion that reflects consistent and compatible findings between the State and Federal agencies. The Department will, if possible, adopt the Federal biological opinions as the Department's written findings with respect to species listed under both CESA and ESA.

Consistent with CESA, the Department is evaluating projects in the Delta from the perspective that each project should not only offset its adverse impacts on fish and wildlife but also assist in the recovery of the Delta. The Contra Costa Water District's Los Vaqueros Project was, and the Interim South Delta Program is being evaluated in this manner. CESA compliance for the DW Project will be achieved in two steps. The Department's first step is the completion of a comprehensive 2081 Memorandum of Understanding and Management Authorization with DW which addresses listed fish and wildlife directly and cumulatively affected by the project and growth inducing impacts. Completion of the 2081 process will facilitate the Department's second step, preparation of a Biological Opinion for the Board, pursuant to Section 2090,on the Board's issuance of a water right to DW. **B6-8 cont'd**

As you are probably aware, a petition to list spring-run chinook salmon has been submitted to the Fish and Game Commission. The Department's recommendation on whether to accept the petition must be provided to the Commission by January 17, 1996. The Commission will consider the Department's recommendation and receive public comment at the Commission meeting in March, 1996. If the Commission accepts the petition and the spring-run salmon becomes a candidate for listing, a one-year formal review period will begin. The Department will report its findings and provide a recommendation regarding listing to the Commission at the end of the review period. During the one-year review period, the spring-run chinook salmon will be afforded full protection under CESA.

Fishery Impact Analysis and Significance Determination

The discussion of Fishery Resources (Chapter 3F) and the Biological Assessment for impacts to fish species (Appendix F-2) contains an analysis of fishery impacts that is well done, concise, and generally accurate. Jones and Stokes Associates staff, on behalf of the Board and COE, should be commended for their skillful efforts in assembling a complex array of aquatic data and issues and presenting that information in a manner that is greatly facilitating our Department's analysis of the proposed project. We do have concerns about three areas of the analysis that should be addressed in the final EIR/EIS: changes in the area of optimal salinity habitat, the entrainment risk for winter-run chinook salmon and other Sacramento River races of salmon, and the determination of impact significance.

Optimal Salinity Habitat

In describing project effects on optimal salinity habitat the DEIR/DEIS should consider factors such as the percentage of the area with optimal salinity that is shallow shoal habitat, the proximity to SRA habitat and tidal wetlands, and the percentage of the area that is within the influence of the SWP and CVP export facilities. All of these factors contribute to the "quality" of optimal salinity habitat. Without consideration of these factors, conclusions about net changes in this habitat can be misleading. Information on these factors and on the location of X2 should be included in the analysis. The Department believes that the project, as its operations are presently described, will result in a significant reduction in both the area and quality of optimal salinity habitat for Sacramento splittail, longfin smelt, and delta smelt. Measures to offset those impacts will be developed in the consultation currently underway.

Hydrodynamic Impacts

The DEIR/DEIS underestimates project impacts on winter-run chinook salmon. Hydrodynamic changes in the lower San Joaquin River and Three-Mile Slough can result in higher entrainment of juvenile salmon into the south Delta particularly under conditions of negative Q-West flows. B6-9

Furthermore, considering that juvenile salmon are rearing and migrating through the Delta in the late fall through spring, a larger percentage of the population is probably vulnerable to adverse project effects than is indicated because the impact analysis is based on average patterns and rates of migration through the Delta. The cumulative presence data recently provided to us by Jones and Stokes Associates should be described in the DEIR/DEIS. It will be valuable in assessing the impacts of hydrodynamic changes and formulating measures to avoid and reduce impacts to juvenile winter-run chinook salmon.

Impact Significance

The Department understands that an iron-clad definition of significance is not always possible because significance may vary with the environmental setting. The statewide, regional, or area wide significance of the environmental setting has a large bearing on the determination of impact significance. Also, if existing impacts are already deemed significant and those impacts are increased by the project they are, by definition, also significant. In the case of the DW Project, the setting is the Sacramento-San Joaquin Delta as defined in Water Code, Section 12220. CEQA Guidelines 15206 subd. (4)(E) states that the Delta is an area of critical environmental sensitivity which is of statewide, regional, and area wide significance. The importance of the Delta to fish and wildlife resources is also recognized nationally and

internationally. In addition, Delta fish have been and are being significantly impacted by the operation of the State and Federal water projects. Therefore, the incremental impacts resulting from the DW Project must, pursuant to CEQA Guidelines, also be considered as significant.

For these reasons the Department does not concur with some of the conclusions in the final EIR/EIS which state that certain fishery impacts are less-than-significant. This is especially true for impacts to fishery resources of the Sacramento River system such as the various races of chinook salmon, as well as striped bass and American shad. Impacts should be reevaluated and suitable measures should be developed to offset those impacts. This information should be incorporated into the final EIR/EIS.

Aquatic Resources Mitigation

The final EIR/EIS needs to include a comprehensive mitigation plan and post-project monitoring plan for winter-run chinook salmon, delta smelt, and other fish and wildlife as required pursuant to Assembly Bill 3180. CEQA requires that specific mitigation measures be identified (CEQA Guidelines, Section 15126). These measures must be capable of: 1) avoiding the impact altogether by not taking a certain action or parts of an action; 2) minimizing impacts by limiting the degree or magnitude of the action and its implementation; 3) rectifying the impact by repairing, rehabilitating, or restoring the impacted environment; or 4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action (CEQA Guidelines, Section 15370). A potentially acceptable approach is the development of a comprehensive Aquatic Resources Management Plan (ARMP) patterned after the HMP for the terrestrial resources affected by the DW Project. Three operational measures that could be assessed and included in the ARMP include: 1) modification of project diversions, 2) using project releases to enhance fishery resources, and 3) modification of the sequence of reservoir island releases made for export by the SWP and CVP. An example of operations under the first measure would involve the cessation of diversions onto reservoir islands by a predetermined date such as January 31. Such operations could reduce significant fishery impacts in some years while maintaining project feasibility. The second measure would involve releases of stored water in May, June, and July with SWP and CVP pumping either maintained or reduced and upstream operations remaining unchanged. This approach could provide fishery benefits if issues related to adversely increasing water temperatures could be resolved. As a third measure, the DW Project could be operated such that when larval life stages are abundant in the central Delta releases for export could be restricted to Bacon Island.

B6-9 cont'd

During recent meetings with DW a broad array of mitigation measures have been discussed. While much of the discussion and most of the challenges rest with addressing entrainment and hydrodynamic effects of the project, three other topics will also have to be addressed: increased predation, impacts on aquatic habitat related to the recreational facilities, and impacts on dissolved oxygen (DO).

Predation

Even with the implementation of avoidance measures and fish screens described in the DEIR/DEIS, salmon, delta smelt, longfin smelt, and Sacramento splittail will be lost during project filling and subsequent release for export. Increased predation is expected to occur at intake and drain stations and recreational boat dock structures. The Department will work closely with DW to evaluate how these unmitigated fish losses may be offset by measures such as screening other non-project diversions. **B6-10**

Aquatic Habitat

The DEIR/DEIS states that a five percent increase in annual boater use-days is expected at project build out (page 3J-14). The increased erosion due to the higher number of boats in the Delta will damage SRA habitat throughout the Delta. In addition, reservoir island discharges may increase channel velocities and erode channel islands on the northeast side of Franks Tract and in Santa Fe Cut.

Mitigation of SRA habitat can be accomplished using specifications provided by the Department and USFWS to offset anticipated erosion impacts in Franks Tract and Santa Fe Cut and to partially offset Delta-wide erosion impacts. In addition, the Board may wish to require an endowment or annual contribution to a fund based on the volume of water diverted, to be administered by the Department for the development and long-term maintenance of SRA, riparian, and shallow shoal habitat throughout the Delta. DW's mitigation measures could be carried out in combination with other programs that are currently underway (e.g. SB-34, Category III, etc.) to enhance the value of these measures to fishery resources. **B6-11**

Dissolved Oxygen

DO levels below 6.0 mg/l can interfere with the movement of fish such as adult salmon. At no time should releases be made if reservoir water has DO levels < 6.0 mg/l. Monitoring of DO levels should be the responsibility of DW and should be included as a permit condition. **B6-12**

The Department will continue to work with DW and the lead agencies to develop appropriate measures for a comprehensive aquatic resources mitigation plan. The dialogue among DW and the state and federal fish and wildlife agencies has helped to begin to define the key components of this plan. We encourage all the parties to continue to work closely with our intra-Department aquatic resources team as this process continues.

Potential Operational Changes

In general, fish and wildlife resources may be affected by changes in upstream reservoir operations and export patterns resulting from purchase of DW water and from water transfers or water banking involving DW. The DEIR/DEIS briefly discusses the potential for the Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (USBR) to modify their operations in response to the proposed project. Export pumping of DW water supplies by the SWP and CVP could allow greater flexibility for operation of upstream reservoirs. This flexibility could affect fishery resources in a variety of ways, both positive and negative, depending on how it is used. Recent discussions have centered on the need to evaluate CVP and SWP operational changes and potential impacts either now or at some point in the future when DW is coordinated with or purchased by the SWP, CVP, or other entity.

B6-13

Board staff have emphasized that DW, or any subsequent owner/operator would be required to operate the project under permit conditions imposed by the regulatory agencies. Any changes in project operations beyond the scope of the permitted project would require an amended water right and be subject to additional CEQA documentation. The USFWS has also stated that its current Biological Opinion for the SWP and CVP is for a given set of facilities and operations and if there is a significant change, such as the purchase and operation of the DW Project in conjunction with existing facilities, re-consultation would be required. At a minimum, the COE permit and the Board water right permit should include terms and conditions that require a supplemental EIR/EIS and re-consultation with the fish and wildlife agencies if the DW Project is acquired by DWR, the USBR or other entity, or if the DW Project is operated in conjunction with those entities.

The Department is also concerned about potential direct and secondary impacts of the DW Project related to water transfers. The DEIR/DEIS does not evaluate DW operations for water transfers and water banking. Some, but not all, transfers or banking transactions involving DW will require Board approval and only some of those will be reviewed under CEQA. We recommend that the discussion of how this EIR/EIS would be used (Page 1-2) be expanded to articulate the Board's review and approval responsibilities related to the type of

B6-14

water transfers and banking transactions in which DW is likely to participate. We are interested in an assessment of the percentage of potentially transferable water that would come under the Board's purview as an indicator of the potential extent of transfers involving DW that could occur without further environmental review. **B6-14 cont'd**

Recreation Facilities

The DW Project includes 38 recreational facilities each having a 30-berth boat dock. Approximately 18 acres of shallow water habitat would be covered by these docks and the docks associated with the siphon and pump stations. The marina component of the DW Project will result in the take (by killing and harassment) of delta smelt. Placement of docking structures into and over the water shades submersed aquatic plants, decreasing their growth and productivity, thus decreasing spawning substrates and hiding cover for delta smelt. Predatory fish are attracted to structures which will thus increase direct losses of delta smelt due to predation. Maintenance dredging involves the routine removal of submerged rocks and branches which further decreases spawning areas and hiding cover for delta smelt. Increased boat traffic with resulting fuel and oil spills, increased noise and turbulence and the potential for higher loading of toxic chemicals into the Bay-Delta Estuary from anti-fouling boat paints may result in additional take of the species. **B6-15**

The Department believes that the boat docks associated with the recreation facilities represent a significant, avoidable impact. The DEIR/DEIS describes the environmental effects of constructing generic dock facilities without specific information on site characterisitcs. We believe that permits for dock facilities should be based on site-specific analyses including consideration of alternative locations to reduce or avoid impacts. Authorizing construction of 38 marina facilities in the permit for the DW project precludes any site specific evaluation. For this reason, we recommend the COE consider permitting a limited number of dock facilities now and require new permits to construct more facilities in the future. Alternatively, we suggest the COE consider consolidation and reduction of the dock facilities that are proposed. In the Department's view, these dock complexes are not a project feature integral to the project purpose in that the islands can serve the project purpose as defined in Chapter 2 without the need to develop dockage facilities for up to 1,140 boats. **B6-16**

Figure 1 in Chapter 2 shows the location of the 13 existing marinas in the project area. Furthermore, as pointed out in Chapter 3J, over 100 commercial marinas exist in the Delta, many in close proximity to the project islands (Figure 3J-1) and with sufficient space to accommodate DW boat recreationists. Sufficient roads exist to provide access to the recreational facilities depicted in Chapter 3J and Appendix 2.

The proposed recreational facilities located along the levees on the eastern one-third of Bouldin Island could also adversely affect current use of this area by sandhill cranes. DW should consider relocating these facilities. B6-17

External Levees

The DEIR/DEIS does not adequately characterize issues related to reconstruction or maintenance of the levees. The final EIR/EIS should note that riparian, fisheries, and wildlife habitats were adversely impacted on DW Project islands under the SB 34 program in the period 1987-1991 but that all shrub-scrub, freshwater marsh, and riparian forest impacts, including anticipated future impacts, were mitigated off-site at Medford Island. Mitigation for the loss of approximately 9,000 feet of SRA habitat is still needed and opportunities to address this need within a larger-scale habitat restoration program should be considered as part of the DW Project. B6-18

Berm Islands

Various sections of the DEIR/DEIS discuss the DW Project's effects on hydrodynamics, vegetation, and wildlife on the interior and along the water-side of the levees of the four project islands. However, the DEIR/DEIS does not adequately discuss the effects on in-stream channel islands or berms that surround the project islands. B6-19

Channel islands and berms provide habitat for a high diversity of endemic plants and animals and are remnants of what was once a dominant habitat in the Delta. Berm islands are subjected to a number of forces that are diminishing their habitat quality and quantity. Peat mining, wave wash from passing boats, and scour from increased water velocities all contribute to the erosion and habitat degradation of those islands.

The DEIR/DEIS (page 3B-5) states that "Diversion and export pumping can also increase channel velocities". The proposed recreation facilities have the potential to significantly increase the number of boaters and wave wash affecting the surrounding channels. Increased in-channel water velocities and recreational boaters could significantly impact berm islands and decrease habitat for sensitive species. The potential for these significant impacts has not been adequately addressed in the DEIR/DEIS. **B6-19 cont'd**

The final EIR/EIS should include a discussion of these impacts along with suitable mitigation measures. This should include the berm islands surrounding the four project islands as well as berm islands located in other Delta channels that could be affected by the proposed project.

Growth-Inducing Impacts

The final EIR/EIS should refer to the DWR's status report titled "Procedure for Estimating the Environmental Impacts of Increasing Water Deliveries to State Water Project Service Areas" as modified by the Department's comments dated June 23, 1995. The purpose of the Service Area Impact Study is to describe a process for evaluating the potential environmental impacts of additional SWP supplies within the SWP service areas through the year 2020, including both direct and indirect effects to fish and wildlife habitat. These methods should be adapted to evaluate the DW Project with close involvement by state and federal fish and wildlife agencies. **B6-20**

The DEIR/DEIS should describe a process for preparation of mitigation plans or regional multi-species plans and implementation of recommended mitigation measures to offset growth-inducing impacts. These plans should further the goals of the CESA and should describe for instance, acquisition of sensitive habitats and key movement corridors in the project service area for listed and candidate species. The Department is prepared to work closely with DW to develop an approach which reduces growth-inducing impacts to less-than-significant levels.

Public Recreation Access

The DEIR/DEIS accurately describes the fact that there is a significant shortage of public recreational opportunities in the Delta, particularly for activities such as nature study, photography, wildlife viewing, and hunting (Chapter 3J). A subject of great importance to the Department is exploring the potential for including public recreation as a part of the proposed project. A public recreation component would provide important opportunities for public recreation in the Delta, a location where such opportunities are in critically short supply while demand for those opportunities is extremely high. **B6-21**

In a March 2, 1994 letter to the Board and the COE, DW stated that providing for public recreation could be an important feature of the Project. Provisions for public hunting on 1,200 acres on Holland Tract and 5,000 acres on Bacon Island were described in that letter. The Department welcomes further discussions among the State and federal lead agencies and the DW Project to pursue opportunities regarding public access. **B6-21 cont'd**

Closely regulated activities such as hiking, nature study, photography, wildlife observation, and hunting could be provided in a manner that does not interfere with the management of these islands. Public hunting would be conducted under the limitations described in the HMP and would be compatible with activities in the private recreation areas.

Environmental Resource Fund

We are encouraged by DW's offer to contribute $2 for each acre-foot of water sold for Delta export to fund ecological research in the Bay-Delta Estuary consistent with the CALFED Bay-Delta Program. We have a few suggestions to enhance this feature of the Project. First, the appropriateness of the $2 per acre-foot contribution needs to be analyzed with reference to ecological research needs in the Bay-Delta Estuary. Second, DW should evaluate a mechanism for adjusting the contribution for inflation. Third, consideration should be given to partitioning the fund to cover wildlife and fishery related research separately. Lastly, a neutral third party "Grants Committee" should be formed to make the final selection of approved projects and designate funding levels. **B6-22**

Recommended Corps Permit and Water Right Conditions

This letter describes the various concerns that the Department has regarding the proposed project. We have recommended several approaches to avoid or reduce adverse impacts and have also described specific mitigation measures. The Department will continue to work with the COE and the Board staff to resolve outstanding issues and define measures necessary to protect fish and wildlife that can be included as terms and conditions within the COE permit and Board water right permit for the DW project. These terms and conditions must be binding upon anyone who would purchase and operate the DW Project in the future. If the reservoir portion of the project is subsequently transferred or sold, all of the protective measures for fish and wildlife must continue, including implementation of the ARMP, HMP, Management Agreements and Biological Opinions. **B6-23**

Summary

The DEIR/DEIS, in general, analyzes the proposed action using appropriate analytical techniques that are based on sound technical data and assumptions. However, as we have described above, we believe the DEIR/DEIS does not properly identify all significant impacts to fish and wildlife and does not include adequate mitigation for those impacts. We recognize fully the effort put forth in bringing this DEIR/DEIS to this point and appreciate the opportunity to participate in the development of the HMP and provide advice in the early stages of preparing the DEIR/DEIS. When the recommended revisions described in this letter and enclosed appendices are made, we believe the DEIR/DEIS will comply with State and Federal law. We are willing to participate in making any necessary modifications and look forward to fulfilling our obligation under AB 3180 to assist with the development of an adequate mitigation and monitoring plan.

Thank you for the opportunity to provide these comments. If you have any questions or need additional information, please contact Mr. Frank Wernette, Bay-Delta and Special Water Projects Division, 4001 North Wilson Way, Stockton, California 95205, (209) 948-7800.

Sincerely,

C. F. Raysbrook
Interim Director

Attachments

cc: See next page.

2 orig

cc: Mr. Wayne White
U.S. Fish and Wildlife Service
Sacramento, California

Ms. Hilda Diaz-Soltero, Regional Director
National Marine Fisheries Service
Long Beach, California

Ms. Cynthia Chadwick
Environmental Protection Agency
San Francisco, California

The Resources Agency
Sacramento, California

Mr. Robert Potter
California Dept. of Water Resources
Sacramento, California

APPENDIX A

Appendix to Department of Fish and Game
Comment Letter on the
Proposed Delta Wetlands (DW) Project
DEIR/DEIS

Specific Comments

SPECIFIC COMMENTS

Chapter 2: Delta Wetlands Project Alternatives

The proposed project provides for the management of shallow water on the reservoir islands during periods of non-storage using an inner levee system on the reservoir islands. Shallow water management should not be optional as described in this section. When the Department evaluated the suitability of the habitat islands as adequate compensation for the loss of wintering waterfowl habitat on the reservoir islands we assumed that shallow water management would be implemented on the reservoir islands. DW or its successors should be required to operate the reservoir islands as described on page 2-4 of Appendix 2. While DW is not held to any specific requirements for the frequency of shallow water management the development of the inner levee system and management of shallow water habitat during periods when the reservoirs are not flooded under partial or full storage operation is, by definition, part of the project, and is therefore, required by DW. B6-24

Chapter 3A: Water Supply and Water Project Operations

Page 3A-5, Delta Water Project Operations:

This section states that DW Project operations will likely influence upstream reservoir storage if either the SWP or CVP buy and export DW water as a replacement for reservoir releases. Any related modifications of SWP or CVP operations could result in a reconsultation of the current OCAP opinion. B6-25

Page 3A-12, Upstream Reservoir Storage:

The text needs to describe in more detail how rediversion will affect existing water right permits for the SWP and CVP and compliance with the 1995 WQCP and USFWS and NMFS biological opinions. At least one concern relates to the potential negative effects on instream flows below reservoirs. B6-26

Chapter 3B: Hydrodynamics

Page 3B-1:

It is not clear how water banking or water transfers will be carried out without close coordination with SWP and CVP export facilities. Coordinated operations of the DW Project with the SWP and CVP could be optimized to improve fishery resources. B6-27

Page 3B-8:

A hydrodynamic simulation of the DW Project that does not include installation of the temporary agricultural barriers may not be sufficient to fully assess fishery impacts. The final EIR/EIS should include a model simulation with the three agricultural barriers in place. B6-28

Pages 3B-17 and 18, Impacts B-1 and 2:

The Department does not concur with the assessment that local hydrodynamic effects are not significant and require no mitigation. In our view, these hydrodynamic changes risk significant impacts to important shallow shoal and SRA habitat. Compensation areas should be provided to offset these losses. B6-29

Chapter 3C: Water Quality

The Department's concerns are principally related to impacts on water temperature, dissolved oxygen (DO) levels, and salinity as indicated by the location of X2 and the area of optimal salinity habitat for fish. At a minimum, the Board and COE should incorporate the mitigation measures described in this chapter as terms and conditions of their respective permits. Additional measures that are necessary to offset adverse impacts to fishery resources are currently being developed during CESA and ESA consultation meetings. B6-30

Chapter 3-D: Flood Control

Page 3D-15, Impact D-4:

The Department does not concur with the finding that levee toe erosion and erosion of nearby vegetated berms would not increase with the DW Project. Specific compensation measures should be described to replace habitat impacted by project operations. B6-31

Chapter 3E: Utilities and Highways

Page 3E-3:

Construction of transmission lines to provide electricity to recreation facilities on the western one-third of Bouldin Island, the northern half of Holland Tract, and Webb Tract will likely increase the mortality of waterfowl due to increased bird strikes. The development of nesting habitat described in the HMP will offset this impact. Therefore, creation and management of nesting habitat for waterfowl, including brood ponds, should be mandatory. B6-32

Chapter 3F: Fishery Resources

Page 3F-5, Factors Affecting Abundance:

Little evidence is available which implicates discharge of toxic materials as a primary factor influencing young striped bass abundance in the Delta. Measures to offset the incremental entrainment of eggs, larvae, and juveniles as a result of the DW Project should be the focus of discussion. B6-33

Page 3F-10, right column, second paragraph:

This section explains that Delta SOS simulations cannot encompass all permutations that could occur such as operational decisions at the discretion of DW, DWR, USBR, or the Board. It is not clear what operational decisions are at the Board's discretion or how the magnitude of potential adverse effects of the proposed project can be accurately assessed considering this operational uncertainty. The Department believes that those potential operational criteria should be carefully described. Without a clearer view of the project and its operation, it will be extremely difficult to evaluate the project and render an opinion under the CESA. B6-34

Page 3F-10, right column, last paragraph:

This section states that the intensive agriculture alternative (no-project alternative) was used as the base for comparing other project alternatives. Intensive agriculture is the alternative that will be implemented if project approval is denied rather than the existing condition. Table 2-2 in Chapter 2 indicates that the no-project alternative has an annual water budget of twice the existing condition. The use of that alternative as the base will tend to over-value any reduction in diversions associated with reducing or eliminating farming and may slightly underestimate adverse project impacts. B6-35

Page 3F-12, Estuarine Habitat Area:

It is not clear that the methods described to assess project impacts to habitat area based on optimal salinity range calculations accurately assesses project impacts on estuarine habitat. Particularly problematic are the weighting strategies and the fact that optimum rearing habitat, i.e. shallow shoal habitat, is scarcer further upstream in the Delta. This is particularly true for delta smelt. B6-36

Page 3F-15, Mitigation Measure F-1, Fish Habitat Management:

Areas that are dredged or covered by fill or boat docks should be replaced at 3:1. For instance, the cumulative area affected by the proposed covered dock complexes associated with the recreation facilities is nearly 18 acres. The DW Project should, in coordination with the State and federal fish and wildlife agencies, identify specific restoration strategies including areas where replacement habitat can be restored. B6-37

Mitigation should not be limited to shallow vegetated habitat but should also include shallow shoal habitat, vegetated or not. This habitat is defined as any area less than 3 meters MHW.

Page 3F-16, left column, first paragraph:

DW should consult with the Department relative to the timing of in-water construction and maintenance activities. The Department will base its recommendations on guidelines developed for the protection of delta smelt in the draft report titled "Mitigation for Impacts of In-Channel Modification Projects to the Delta Smelt (*Hypomesus transpacificus*) in the Sacramento-San Joaquin Estuary." DW should also be aware of Department guidelines governing activities that could impact winter-run chinook salmon. The COE and Board should make conformance with these guidelines conditions of DW's permits. **B6-37 cont'd**

Page 3F-16, left column, last paragraph, Dissolved Oxygen:

The Department does not concur with the conclusion presented that DO levels will not be a concern with the project and recommends that a specific mitigation measure be developed to address this concern. We will present our specific recommendations during our ongoing CESA and ESA consultation meetings.

B6-38

Page 3F-17, Mitigation Measure F-2, Temperature:

The Department does not believe this mitigation measure will reduce impacts to a less-than-significant level. The Department is currently working with DW and the lead agencies' consultants to develop an acceptable measure.

Page 3F-17 to 18, Effects on Outflow and Salinity:

The DEIR/DEIS states that during February-June X2 is shifted upstream up to 1.4 km and during September-November X2 can shift upstream over 3.5 km. The document needs to describe antecedent conditions immediately prior to the February-June period. Potential impacts associated with this shift and adequate mitigation measures need to be described in the final EIR/EIS. **B6-39**

Page 3F-20:

Reduced Sacramento River flows should be included in the list of major concerns about chinook salmon when DW discharges are exported during April-June.

B6-40

Page 3F-20, column 2, paragraph 2:

The effect of reduced Sacramento River flow (due to export of DW discharge) on the salmon mortality index should be disclosed in the final EIR/EIS.

Page 3F-21, Optimal Salinity Habitat:

Changes in optimal salinity habitat are described as being small, but do not take into consideration the risk of additional entrainment. Much of the habitat for delta smelt and striped bass is within the influence of the SWP and CVP export pumps, and now additional sources of entrainment are being added, expanding the risk of entrainment. Obviously this is not all "optimal habitat" when the increased risk of entrainment is considered. Striped bass may have a better chance for survival downstream of their optimal salinity range than within it if they are more vulnerable to the export diversions. The decrease in entrainment of larval striped bass and increase in optimal salinity under Alternative 1 is probably overestimated because this alternative is compared to a scenario of intensive agriculture rather than existing conditions. B6-41

Page 3F-21, right column, paragraph 3, Striped Bass Transport:

It is inaccurate to infer eggs and larvae produced in the San Joaquin River are less likely to be entrained since very little of the San Joaquin River is downstream of the central Delta. Eggs and larvae produced in the lower San Joaquin River can be subjected to the same levels of entrainment because they can eventually be transported to the central Delta. B6-42

Page 3F-22, left column:

The text should state that there is also significant entrainment of American shad from August-October. Many American shad enter the central Delta as evidenced by the millions of individuals salvaged at the SWP and CVP. B6-43

Page 3F-23, right column, last paragraph, Optimal Salinity Habitat:

The assumptions and calculations that conclude that there is a net increase in optimal salinity habitat for delta smelt are not consistent with the data in Table 5-5 of Appendix F-2 which shows an upstream shift of X-2. The extent of decreases in Delta outflow are likely to result in significant reductions in optimal salinity habitat. B6-44

Page 3F-23, right column, Longfin Smelt Transport:

It is true that longfin smelt spawn primarily in the Sacramento River; in the confluence area; and, in Suisun Bay when salinity conditions are favorable. In high outflow years, entrainment is not a problem because buoyant pelagic larvae hatch low in the system and are transported out of the influence of the pumps. However, during low flow years when longfin spawn higher in the system DW pumping during February (peak larval abundance) will result in a new source of entrainment. B6-45

Page 3F-23, right column, last paragraph:

The 5.6 percent increase in entrainment of longfin smelt is a concern. Winter

diversions (especially January-March) act as a double negative. During low outflow years, longfin spawning habitat shifts into the Delta and areas upstream of the Delta, resulting in increased entrainment of migrating adults. Larvae are subsequently vulnerable to entrainment as they pass through the Delta or use it as rearing habitat. In years of low Delta outflow transport flows out of the Delta are decreased and there is less rearing habitat. Increasing exports during the January to March period in a series of dry or critical years could reduce longfin smelt abundance to critically low levels such that the population may not rebound. An additional 9,000 cfs being drawn toward Webb Tract and Bacon Island is of particular concern since the 1995 WQCP allows a high diversion rate in January and in February in some years. The DW Project will increase the probability of attaining the maximum allowable exports under the 1995 WQCP. The DEIR/DEIS does not contain adequate mitigation measures to reduce impacts to longfin smelt larvae, particularly in February. B6-45 cont'd

DW Project operations could affect splittail spawning habitat upstream to the extent that reservoir releases are reduced when DW discharges are being exported. B6-46

Page 3F-24, Impact F-4:

Based on information in the DEIR/DEIS, such as life history data for chinook salmon shown in Figure 3F-1, the conclusion that the DW Project would not adversely impact Sacramento River races of chinook salmon can not be supported. For instance, the spring-run is now being considered for listing under CESA and is vulnerable to a similar extent as winter-run. In the Department's view, impacts to all races and runs of chinook salmon are significant and mitigation measures to offset those impacts will need to be developed. The Department will continue to work with DW and the lead agencies to address fishery impact concerns for both listed and non-listed species.

Adverse impacts to Sacramento River fish including chinook salmon, delta smelt, and striped bass will occur due to increased entrainment at the Delta Cross Channel and Georgiana Slough. Adverse impacts to those species are also expected due to a 19 percent increase in net channel flows in Three-Mile Slough toward the central Delta from the Sacramento River (Table B1-7). Flows in the San Joaquin River, measured near Jersey Island, changed from 20,109 cfs to 14,354 cfs, a change of 5,755 cfs. These hydrodynamic changes are expected to pose considerable risks to Sacramento River fish. B6-47

An increase in flows south and west from the San Joaquin River in the vicinity of the mouth of Old River and Middle River at Columbia Cut subjects San Joaquin fall-run

chinook salmon to unfavorable conditions. Increases in reverse flows were 23 percent and 47 percent respectively.

Page 3F-24, Mitigation Measure F-3:

The portion of this measure that restricts diversions to fill reservoir islands is a

reasonable, first step at addressing impacts to salmon in the April through June period. Further restrictions on diversions are necessary to avoid the peak outmigration of winter-run and spring-run salmon. The other component of this measure related to the CDFP is probably not adequate to protect San Joaquin fall-run salmon considering the data displayed in Table B1-8 in Appendix B-1. The CDFP reflects the fate of particles released in the Mokelumne River box of the transport model (Figure 1 of Appendix A of Appendix F2). Water released from storage and rediverted by the SWP or CVP is not likely to significantly change channel flows in that portion of the Delta represented by the Mokelumne River box even though significant hydrodynamic changes could occur in the central Delta and south Delta. Under low flow conditions in the San Joaquin River, DW Project diversions can change a positive base flow to a negative flow.

Based on the Summary of Typical Net Delta Channel Flows (Table B1-8), for DW discharges of 6,000 cfs, these flows changed as follows: B6-47 cont'd

Location	*RMA Mode No.*	*% Increase in Flows Toward Export Facilities*
Middle River at Columbia Cut	*159*	*16% increase*
Middle River at Victoria Cut	*135*	*212% increase*
Old River North of Clifton Court	*83*	*221% increase*
Head of Old River	*54*	*34% increase*

Page 3F-25, Adaptive Measures:

Once specific management and operational measures are established, adaptive measures may be used to provide additional benefits. Realistically it may not be possible to use real time monitoring for winter-run or spring-run chinook salmon. More consideration could be given to an adaptive management plan. There needs to be further development of appropriate evaluation criteria. The final EIR/EIS should elaborate on its description of these measures.

Page 3F-25, Mitigation Measure F-4:

This measure fails to be sufficiently protective of egg and larval stages of striped bass, delta smelt, longfin smelt, and American shad. Figure 3F-3 further illustrates why this measure is not adequate since diversions are not restricted during particularly critical times for these species. B6-48

Page 3F-26, DW Operations Objectives:

The DEIR/DEIS should elaborate on its discussion of how the DW Project can be integrated into the CALFED Ops group process. B6-49

Page 3F-26, Impact F-6:

The Department does not agree with the conclusion that the changes in the area of optimal salinity habitat is a less-than-significant impact. DW should include specific mitigation measures to address this impact. Outflow and habitat reductions will outweigh any increase due to foregone agricultural diversions. Mitigation could be in the form of restoration of shallow water habitat, for example on Prospect Island. B6-50

Page 3F-27, Mitigation Measure F-5:

When X2 is near Collinsville, striped bass and delta smelt will be in the Delta and vulnerable to entrainment. This measure may not really "minimize" entrainment losses. Allowing diversions to occur only when X2 is downstream of Chipps Island would probably be a better measure to "minimize" losses. The Department will continue to work with DW to improve the effectiveness of this measure. B6-51

Page 3F-27, Impact F-8:

The Department does not agree with the conclusion reached in the DEIR/DEIS that screening the project's intakes will reduce the impact of entrainment losses of juvenile American shad and other species to less-than-significant levels. The Department will continue to work with DW to develop adequate compensation measures, particularly for increased indirect impacts.

Page 3F-28:

The Department's comments on Alternative 1 apply to Alternative 2 as well. B6-52

Page 3F-28 and 30, Impacts of Alternatives 2 and 3:

Keep in mind that evaluations of the effects of the 1995 WQCP are not based on the standards. They are based on the conditions estimated by operations studies with the projects operating to the standards. Impacts occur even though standards may be met; therefore, from a fishery perspective, the flows are not surplus. B6-53

Page 3F-35, Cumulative Impacts:

If the Department's comments on Alternative 1 are adequately addressed in a comprehensive mitigation plan, no significant cumulative impacts will likely occur. However, as presented in the DEIR/DEIS, these cumulative impacts are not reduced to less-than-significant levels. B6-54

Chapter 3H: Wildlife

Page 3H-11:

The HEP team used the white-fronted goose as an initial indicator to help craft the HMP. However, the Department reassessed performance of the HMP for all of the waterfowl evaluation species. For the tundra swan for instance, the HMP continued to perform well and in conjunction with management of shallow water habitat on the reservoir islands during non-storage periods, impacts to this species were also offset. **B6-55**

Page 3H-14:

Reference to a shallow storage condition without an inner levee system should be deleted since the inner levee system is, by definition part of the project description. Furthermore, shallow water wetland management is not at DW's discretion and should be included as a term and condition of the COE permit and water right permit. Shallow water management is necessary to offset impacts to the tundra swan and to ensure proper management to alleviate avian botulism concerns. **B6-56**

Page 3H-21, Impact H-2:

Reference to management of the reservoir islands with an inner levee system should be clarified. **B6-57**

Chapter 3J

Page 3J-13, right column, paragraph 1:

The DEIR/DEIS states that 798 boats could be provided with permanent dockage, yet up to 1,140 are possible. The basis for the calculation in the DEIR/DEIS should be provided. **B6-58**

Appendix 1

The Department previously protested the original applications filed with the Board on July 9, 1987. Although those original applications have been amended and additional permits were applied for on July 21, 1993 and November 24, 1994, the Department's original protest remains. It can be withdrawn when the recommended mitigation and compensation measures that are presented in this comment letter are incorporated as permit terms and conditions. **B6-59**

Appendix 2

Page 2-2, Fish Screening:

The text needs to describe features of the fish screens in greater detail before their adequacy can be determined. The Department is willing to work with DW to ensure that the fish screens will meet applicable screen criteria and adequately protect fishery resources. We are concerned about the adequacy of the manual cleaning methods that are proposed. It isn't clear from examining the sketches how the screens would be raised for cleaning. It is also unclear whether DW will cease diversion during manual cleaning when screen modules may not be operable. The screens need to be designed to meet the 0.2 feet per second approach velocity criteria currently being used by the USFWS. DW needs to develop a protocol for assessing compliance with these criteria and include remedial actions if compliance is not achieved. DW should also develop a screen maintenance plan. **B6-60**

Appendix F2

Appendix B, Table 2:

The text states that this table depicts San Joaquin inflow under the no-project alternative, but instead is a duplicate of total Delta inflow (Table 3). The corrected table should be provided in the final EIR/EIS and in the revised Biological Assessment requested in the general comments portion of this letter. **B6-61**

Appendix B1

Various figures and tables in this section indicate that diversions for storage can cause significant flow changes in Three-Mile Slough and the Lower San Joaquin River near Antioch. Increased flows caused by diversions for storage pose a significant threat to Sacramento River salmon and other special status species. **B6-62**

Appendix G2

Page G2-1:

In the first full paragraph of the right column, the DEIR/DEIS describes an array of reservoir flooding scenarios that may be used by DW to maximize foraging habitat for waterfowl when the islands are managed as shallow water wetlands. While increased benefits to waterfowl are a key feature of the DW Project it is essential that impacts to fishery resources are fully offset through avoidance and mitigation measures. **B6-63**

Page G2-2, fifth bullet:

This assumption should be modified to include the "shallow storage condition along with the non-storage condition when calculating the 60 consecutive days. The management of shallow-water wetland using the inner levee infrastructure required as part of the project should not be optional as implied in this section. B6-64

Page G2-3, right column, paragraph 3:

This paragraph states that water volumes would be the same as for shallow water wetlands, but that no inner levee system would be constructed. This is misleading since the inner levee system is, by definition, part of the proposed project. The final EIR/EIS should clarify the definition of shallow-water storage consistent with DW's proposed project. B6-65

Appendix G3: HMP

Page 16, Monitoring Schedule:

The final EIR/EIS should clarify how monitoring years are designated with regards to monitoring during construction. B6-66

Figures 2 and 4: These figures in the HMP indicate that the so-called Florida tip area in the southeastern tip of Bouldin Island and the eastern half of the area north of Highway 12, which are significant areas used by sandhill cranes, will be converted to a mixture of emergent wetlands and mixed agriculture/seasonal wetland. These areas are also depicted in the HMP as "Free Roam Hunting". Monitoring of crane use in these areas should be conducted to document any changes in use following implementation of the HMP. The level of crane use with the HMP should be at least as high as the current combined use on Bouldin Island and Webb Tract prior to project implementation. B6-67

Appendix G5

Page G5-9, Willow Scrub:

Excavation will be required to create the elevation and hydraulic conditions necessary to maintain strips of willow scrub adjacent to the hunting closed zone. B6-68

Page G5-10, Freshwater Marsh:

We do not recommend using cattail plugs as part of the development strategy. B6-69

Appendix H2

Page H2-13:

Results of surveys for sensitive species of wildlife on project islands have underestimated the value of these islands to wildlife. Surveys on Webb Tract have recorded only 1 sandhill crane and no Swainson's hawk. The DEIR/DEIS (Page 3H-8 to 3H-9) contains some updated information, but the overall description of Webb Tract's habitat value for sensitive species is still understated. Recent information gathered by the Department's Region II during aerial overflights of Webb Tract conducted in winters 1993/94 and 1994/95, revealed 20 to 50 sandhill cranes were foraging on Webb Tract on a regular basis. Similarly, Swainson's hawks have been observed foraging on Webb Tract by the Department during routine avian cholera abatement activities. **B6-70**

APPENDIX B

Appendix to Department of Fish and Game
Comment Letter on the
Proposed Delta Wetlands (DW) Project
DEIR/DEIS

B6-71

Wildlife
Species List
Benefits/Impacts
Summary

Delta Wetlands Project
Status of Compensation for Wildlife Species
of the Bay-Delta Estuary
Due to the Implementation of the
Delta Wetlands Project [1/]

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
BIRDS			
Eared Grebe	X		X
Western Grebe	X		X
Pied-billed Grebe	X		X
White Pelican	X		X
Double-crested Cormorant	X		
Great Blue Heron	X		
Green Heron	X		
Cattle Egret	X		
Great Egret	X		
Snowy Egret	X		
Black-crowned Night Heron	X		
Least Bittern	X		
American Bittern	X		X
Tundra Swan	X		
Canada Goose	X		
White-fronted Goose	X		
Snow Goose	X		
Ross' Goose	X		
Mallard	X		

1/ Assumes prefered project as proposed September, 1995 with Holland Tract and Bouldin Island management using multi-species management following the adoption of the HMP and reservoir islands managed as shallow water wetlands during non-storage periods.

2/ Remaining impacts are judged to be less-than-significant.

Note: Special status species such as federal or state listed or candidate and species of special concern in bold.

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
Gadwall	X		
Northern Pintail	X		
Green-winged Teal	X		
Blue-winged Teal	X		
Cinnamon Teal	X		
American Wigeon	X		
Northern Shoveler	X		
Wood Duck	X		X
Redhead	X		
Ring-necked Duck	X		
Canvasback	X		
Lesser Scaup	X		
Common Goldeneye	X		
Bufflehead	X		
Ruddy Duck	X		
Common Merganser	X		
Turkey Vulture	X		
Black-shouldered Kite	X		X
Sharp-shinned Hawk	X		X
Cooper's Hawk	X		X
Red-tailed Hawk	X		
Red-shouldered Hawk	X		X
Swainson's Hawk	X		
Rough-legged Hawk	X		
Ferruginous Hawk	X		
Golden Eagle	X		
Bald Eagle	X		
Northern Harrier	X		
Prairie Falcon	X		
Peregrine Falcon	X		

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
Merlin	X		
American Kestrel		X	
California Quail	X		X
Ring-necked Pheasant		X	
Sandhill Crane	X		
Virginia rail	X		X
Sora rail	X		X
Black rail	X		
Common Gallinule	X		X
American Coot	X		X
Semipalmated Plover	X		
Killdeer	X		
Mountain Plover	X		
American Golden Plover	X		X
Black-bellied Plover	X		
Common Snipe	X		X
Long-billed Curlew	X		X
Whimbrel	X		X
Spotted Sandpiper	X		X
Willet	X		X
Greater Yellowlegs	X		X
Lesser Yellowlegs	X		X
Pectoral Sandpiper	X		X
Least Sandpiper	X		X
Dunlin	X		X
Short-billed Dowitcher	X		X
Long-billed Dowitcher	X		X
Western Sandpiper	X		X
Marbled Godwit	X		X

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
American Avocet	X		
Black-necked Stilt	X		
Glaucous-winged Gull	X		
Western Gull	X		
Herring Gull	X		
California Gull	X		
Ring-billed Gull	X		
Mew Gull	X		
Black-headed Gull	X		
Bonaparte's Gull	X		
Forster's Tern	X		
Caspian Tern	X		
Rock Dove	X		
Mourning Dove	X		
Yellow-billed Cuckoo	X		X
Barn Owl	X		X
Screech Owl	X		X
Great Horned Owl	X		X
Burrowing Owl		X	
Long-eared Owl	X		
Short-eared Owl	X		X
Poorwill	X		
Lesser Nighthawk	X		
Vaux's Swift	X		
Anna's Hummingbird	X		X
Belted Kingfisher	X		
Common Flicker	X		X
Acorn Woodpecker	X		
Lewis Woodpecker	X		

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
Yellow-bellied Sapsucker	X		
Downy Woodpecker	X		X
Nuttall's Woodpecker	X		
Western Kingbird	X		
Eastern Kingbird	X		
Ash-throated Flycatcher	X		X
Black Phoebe	X		X
Say's Phoebe	X		X
Willow Flycatcher	X		
Hammond's Flycatcher	X		
Dusky Flycatcher	X		
Western Flycatcher	X		X
Western Wood Pewee	X		
Vermilion Flycatcher	X		
Horned Lark		X	
Violet-green Swallow	X		
Tree Swallow	X		X
Rough-winged Swallow	X		
Barn Swallow	X		
Cliff Swallow	X		
Purple Martin	X		
Yellow-billed Magpie	X		
Scrub Jay	X		
Common Raven	X		
Common Crow	X		
Bushtit	X		
White-breasted Nuthatch	X		
Red-breasted Nuthatch	X		
Wrentit	X		

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
Bewick's Wren	X		
Long-billed Marsh Wren	X		X
Mockingbird	X		
American Robin	X		
Varied Thrush	X		X
Hermit Thrush	X		
Swainson's Thrush	X		
Blue Gray Gnatcatcher	X		
Western Bluebird	X		
Golden-crowned Kinglet	X		
Ruby-crowned Kinglet	X		X
Water Pipit	X		
Cedar Waxwing	X		
Phainopepla	X		
Loggerhead Shrike	X		
Starling		X	
Hutton's Vireo	X		X
Solitary Vireo	X		X
Warbling Vireo	X		X
Orange Crowned Warbler	X		X
Yellow Warbler	X		X
Yellow-rumped Warbler	X		X
Black-throated Gray Warbler	X		X
Townsend's Warbler	X		X
MacGillivray's Warbler	X		X
Wilson's Warbler	X		X
Common Yellowthroat	X		X
House Sparrow		X	
Western Meadowlark		X	

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
Yellow-headed Blackbird	X		X
Brewers Blackbird	X		
Red-winged Blackbird	X		
Tri-colored Blackbird	X		
Brown-headed Cowbird		X	
Western Tanager	X		X
Black-headed Grosbeak	X		X
Blue Grosbeak	X		X
Lazuli Bunting	X		X
Evening Grosbeak	X		X
Purple Finch	X		X
House Finch	X		X
Pine Siskin	X		
American Goldfinch	X		X
Lesser Goldfinch	X		X
Lawrence's Goldfinch	X		
Red Crossbill	X		
Green-tailed Towhee	X		
Rufous-sided Towhee	X		X
Brown Towhee	X		
Savannah Sparrow		X	
Grasshopper Sparrow		X	
Vesper Sparrow	X		
Lark Sparrow		X	
Dark-eyed Junco	X		
Chipping Sparrow	X		
White-crowned Sparrow		X	
Golden-crowned Sparrow	X		
Fox Sparrow	X		

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
Lincoln's Sparrow	X		
Song Sparrow	X		
Suisun Song Sparrow	X		
MAMMALS			
Virginia Opossum	X		X
Ornate Shrew	X		
Broad-footed Mole		X	
Yuma Myotis	X		X
California Myotis	X		X
Western Pipistrelle	X		X
Big Brown Bat	X		X
Red Bat	X		X
Hoary Bat	X		X
Townsend's Big-eared Bat	X		X
Pallid Bat	X		X
Brazilian Free-tailed Bat	X		X
Black-tailed Hare		X	
California Ground Squirrel		X	
Botta's Pocket Gopher		X	
Beaver	X		
Western Harvest Mouse		X	
Deer Mouse	X		
California Vole		X	
Muskrat	X		X
Black Rat	X		
Norway Rat		X	

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
House Mouse		X	
Coyote		X	
Gray Fox	X		
Raccoon	X		
Long-tailed Weasel	X		
Mink	X		
Striped Skunk		X	
River Otter	X		
Bobcat	X		
Harbor Seal	X		
Mule Deer	X		
Feral Pig	X		
California Sea Lion	X		
REPTILES			
Western Pond Turtle	X		
Western Fence Lizard	X		
Yellow-bellied Racer	X		
San Joaquin Whipsnake	X		
Coast Horned Lizard	X		
California Whiptail	X		
California Alligator Lizard	X		
Pacific Gopher Snake	X		
Common Kingsnake	X		
Common Valley Garter Snake	X		
Giant Garter Snake	X		

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
AMPHIBIANS			
California Newt	X		
California Slender Salamander	X		
Arboreal Salamander	X		
Western Toad	X		
Pacific Treefrog	X		
Bullfrog	X		

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Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
American Avocet	X		
Black-necked Stilt	X		
Glaucous-winged Gull	X		
Western Gull	X		
Herring Gull	X		
California Gull	X		
Ring-billed Gull	X		
Mew Gull	X		
Black-headed Gull	X		
Bonaparte's Gull	X		
Forster's Tern	X		
Caspian Tern	X		
Rock Dove	X		
Mourning Dove	X		
Yellow-billed Cuckoo	X		X
Barn Owl	X		X
Screech Owl	X		X
Great Horned Owl	X		X
Burrowing Owl		X	
Long-eared Owl	X		
Short-eared Owl	X		X
Poorwill	X		
Lesser Nighthawk	X		
Vaux's Swift	X		
Anna's Hummingbird	X		X
Belted Kingfisher	X		
Common Flicker	X		X
Acorn Woodpecker	X		
Lewis Woodpecker	X		

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
Yellow-bellied Sapsucker	X		
Downy Woodpecker	X		X
Nuttall's Woodpecker	X		
Western Kingbird	X		
Eastern Kingbird	X		
Ash-throated Flycatcher	X		X
Black Phoebe	X		X
Say's Phoebe	X		X
Willow Flycatcher	X		
Hammond's Flycatcher	X		
Dusky Flycatcher	X		
Western Flycatcher	X		X
Western Wood Pewee	X		
Vermilion Flycatcher	X		
Horned Lark		X	
Violet-green Swallow	X		
Tree Swallow	X		X
Rough-winged Swallow	X		
Barn Swallow	X		
Cliff Swallow	X		
Purple Martin	X		
Yellow-billed Magpie	X		
Scrub Jay	X		
Common Raven	X		
Common Crow	X		
Bushtit	X		
White-breasted Nuthatch	X		
Red-breasted Nuthatch	X		
Wrentit	X		

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
Bewick's Wren	X		
Long-billed Marsh Wren	X		X
Mockingbird	X		
American Robin	X		
Varied Thrush	X		X
Hermit Thrush	X		
Swainson's Thrush	X		
Blue Gray Gnatcatcher	X		
Western Bluebird	X		
Golden-crowned Kinglet	X		
Ruby-crowned Kinglet	X		X
Water Pipit	X		
Cedar Waxwing	X		
Phainopepla	X		
Loggerhead Shrike	X		
Starling		X	
Hutton's Vireo	X		X
Solitary Vireo	X		X
Warbling Vireo	X		X
Orange Crowned Warbler	X		X
Yellow Warbler	X		X
Yellow-rumped Warbler	X		X
Black-throated Gray Warbler	X		X
Townsend's Warbler	X		X
MacGillivray's Warbler	X		X
Wilson's Warbler	X		X
Common Yellowthroat	X		X
House Sparrow		X	
Western Meadowlark		X	

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
Yellow-headed Blackbird	X		X
Brewers Blackbird	X		
Red-winged Blackbird	X		
Tri-colored Blackbird	X		
Brown-headed Cowbird		X	
Western Tanager	X		X
Black-headed Grosbeak	X		X
Blue Grosbeak	X		X
Lazuli Bunting	X		X
Evening Grosbeak	X		X
Purple Finch	X		X
House Finch	X		X
Pine Siskin	X		
American Goldfinch	X		X
Lesser Goldfinch	X		X
Lawrence's Goldfinch	X		
Red Crossbill	X		
Green-tailed Towhee	X		
Rufous-sided Towhee	X		X
Brown Towhee	X		
Savannah Sparrow		X	
Grasshopper Sparrow		X	
Vesper Sparrow	X		
Lark Sparrow		X	
Dark-eyed Junco	X		
Chipping Sparrow	X		
White-crowned Sparrow		X	
Golden-crowned Sparrow	X		
Fox Sparrow	X		

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
Lincoln's Sparrow	X		
Song Sparrow	X		
Suisun Song Sparrow	X		
MAMMALS			
Virginia Opossum	X		X
Ornate Shrew	X		
Broad-footed Mole		X	
Yuma Myotis	X		X
California Myotis	X		X
Western Pipistrelle	X		X
Big Brown Bat	X		X
Red Bat	X		X
Hoary Bat	X		X
Townsend's Big-eared Bat	X		X
Pallid Bat	X		X
Brazilian Free-tailed Bat	X		X
Black-tailed Hare		X	
California Ground Squirrel		X	
Botta's Pocket Gopher		X	
Beaver	X		
Western Harvest Mouse		X	
Deer Mouse	X		
California Vole		X	
Muskrat	X		X
Black Rat	X		
Norway Rat		X	

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
House Mouse		X	
Coyote		X	
Gray Fox	X		
Raccoon	X		
Long-tailed Weasel	X		
Mink	X		
Striped Skunk		X	
River Otter	X		
Bobcat	X		
Harbor Seal	X		
Mule Deer	X		
Feral Pig	X		
California Sea Lion	X		
REPTILES			
Western Pond Turtle	X		
Western Fence Lizard	X		
Yellow-bellied Racer	X		
San Joaquin Whipsnake	X		
Coast Horned Lizard	X		
California Whiptail	X		
California Alligator Lizard	X		
Pacific Gopher Snake	X		
Common Kingsnake	X		
Common Valley Garter Snake	X		
Giant Garter Snake	X		

Delta Wetlands Project (cont.)

SPECIES	Species Fully Mitigated	Species Less Than Fully Mitigated 2/	Species Provided Ancillary Benefits
AMPHIBIANS			
California Newt	X		
California Slender Salamander	X		
Arboreal Salamander	X		
Western Toad	X		
Pacific Treefrog	X		
Bullfrog	X		

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California Department of Fish and Game

B6-1. Since this letter was submitted, the SWRCB has concluded formal consultation with DFG on project effects on listed fish species. In 1998, DFG issued a no-jeopardy biological opinion that addressed project effects on delta smelt and winter-run chinook salmon. Additionally, in 1997 NMFS issued no-jeopardy biological opinions that addressed project effects on winter-run chinook salmon, Central Valley steelhead ESU, and Central Valley spring-run chinook salmon ESU; also in 1997, USFWS issued no-jeopardy biological opinions that addressed project effects on delta smelt and splittail. The measures required by the DFG, NMFS, and USFWS biological opinions provide protections for nonlisted aquatic species and their habitats as well as listed species. If the lead agencies approve Delta Wetlands' permit applications, Delta Wetlands will be required to implement the terms of the biological opinions as part of its operating conditions. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for details about the formal consultation and discussion of the biological opinion terms.

B6-2. See Master Response 3, "Areas of End Use and Potential Growth-Inducement Effects of Delta Wetlands Water Deliveries".

B6-3. The California and federal ESA consultation was completed for the Delta Wetlands Project, and the biological opinions were included as appendices to the 2000 REIR/EIS.

B6-4. If the lead agencies approve Delta Wetlands' permit applications, Delta Wetlands will be required to implement the terms of the biological opinions as part of its operating conditions. See also Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-5. Delta Wetlands would be required to implement the HMP to proceed with the project. As identified in the 1995 DEIR/EIS, the HMP was designed to offset all wildlife and wetland effects of the proposed reservoir operations. It should be noted, however, that although management of shallow water on the reservoir islands is included in the project description, it is not required to offset wildlife and wetland effects of the proposed Delta Wetlands Project, including effects on wintering waterfowl.

B6-6. The FOC terms, developed through the federal and California ESA consultation process, place parameters on Delta Wetlands Project operations to ensure that the project would not compromise the protection measures included in the 1995 WQCP and the Water Accord. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", and responses to Comments A4-7 and A7-2.

B6-7. Page 2-8 of Chapter 2, "Delta Wetlands Project Alternatives", of the 1995 DEIR/EIS (see page 2-10 of Chapter 2 of FEIS Volume 1) provided a description of the inner levee system. In response to the commenter's request for more detail about this system, the pertinent text has been changed to include specifications of the inner levee system and its

management. On page 2-8 of Chapter 2 of the 1995 DEIR/EIS (FEIS page 2-10), the second paragraph under "Shallow-Water Management on the Reservoir Islands" has been revised as follows:

> Delta Wetlands would construct and maintain an inner levee system on the bottoms of the reservoir islands. The system would consist of a series of low-height levees and connecting waterways and would manage shallow water during periods of nonstorage. The inner levees would be broad earthen structures large enough to serve as roadways during nonstorage and shallow-water wetland conditions and similar to the structures currently in place on existing farm fields. The inner levee system and associated water control structures would be designed to allow at least 65% of each reservoir island to be flooded to create shallow-water wetlands. At least 50% of the flooded area would be managed to provide an average water depth of 12 inches, and up to 15% of the area would be flooded to a depth of 24 inches or more. Water control structures would be installed to manage water to contain outbreaks of wildlife disease and mosquito production. Appendix 2 includes details on levee design and borrow sites for levee improvement materials. More detail regarding levee design and maintenance is presented in Chapter 3D, "Flood Control".

B6-8. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for a description of the outcome of the consultation process. If the lead agencies approve Delta Wetlands' permit applications, Delta Wetlands will be required to implement the terms of the biological opinions as part of its operating conditions.

As described in Chapter 5 of the 2000 REIR/EIS (see Chapter 3F of Volume 1 of this FEIS) and summarized in Master Response 4, DFG's 1998 biological opinion on project effects on delta smelt and winter-run chinook salmon also assessed project impacts on spring-run chinook salmon, but made no conclusions about effects on this species. However, the restrictions on project operations included in the DFG and NMFS biological opinions for the protection of winter-run chinook salmon cover the period when spring-run chinook salmon occur in the Delta. DFG indicated in its biological opinion that its RPMs would minimize adverse impacts of the incidental take of spring-run chinook salmon as well as that of listed species.

B6-9. This comment refers to several issues that have been addressed through the federal and California ESA consultation process since the comment letter was written.

The relationship between optimal salinity habitat and abundance of fish is difficult to evaluate; however, project impacts on optimal salinity habitat were evaluated in the 1995 DEIR/EIS based on a methodology that recognized a significant relationship between indices of fish abundance and the availability of optimal salinity habitat. To address concerns about optimal salinity habitat, DFG, NMFS, and USFWS included in the FOC

several terms that directly limit the change in the location of X2 that Delta Wetlands diversions would be allowed to cause. These terms are described generally in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", and are detailed in response to Comment A7-3.

The DFG and NMFS biological opinions address potential project effects on juvenile chinook salmon; see Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

The following definition was applied to significance of direct impacts in the 1995 DEIR/EIS (see page 3F-15 of Volume 1 of this FEIS): "[I]mpacts were considered significant if it was determined that conditions contributing to existing stress would be worsened by Delta Wetlands Project operations and facilities, resulting in a substantial reduction in population abundance and distribution". As further noted, the definition of a "substantial" reduction varies with each species; it depends on the ability of the population to maintain or exceed current production levels through mechanisms that compensate for reduced abundance of earlier life stages. Impacts were considered cumulatively significant if project operations and facilities would contribute to existing or future stress that causes or would cause a substantial reduction in population abundance and distribution. The definitions of significance used in the analyses are consistent with CEQA and NEPA.

All potential effects of project operations on aquatic species are addressed by the FOC and RPMs described in the biological opinions. The FOC and RPMs include restrictions on project diversion and discharge operations, measures to compensate for project effects on habitat, and a comprehensive monitoring program. The measures described in the biological opinions replace the mitigation measures presented in the 1995 DEIR/EIS for the proposed project. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for more information on the results of the formal consultation and on terms of the biological opinions.

B6-10. See response to Comment B7-64 for a discussion of the potential for predation at Delta Wetlands facilities.

B6-11. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities". This discussion describes the potential effects of boat use on aquatic habitat and mitigation included in the FOC to compensate for those effects.

Project discharges are not expected to increase channel velocities substantially; additionally, after the 1995 DEIR/EIS was published, Delta Wetlands changed the proposed location of the Bacon Island discharge facility from Santa Fe Cut to Middle River. Therefore, project discharges are not expected to cause erosion of channel islands on the northeast side of Franks Tract or in Santa Fe Cut. The potential effects of maximum Delta Wetlands diversions and discharges on local channel velocity were discussed under Impacts B-1 and B-2 in Chapter 3B, "Hydrodynamics", of the 1995 DEIR/EIS (see page

3B-19 in Chapter 3B of FEIS Volume 1). The results of the analysis indicated that the maximum possible channel velocities that may result from Delta Wetlands Project operations would be within the range of conditions normally encountered during tidal fluctuations in Delta channels that surround the project islands; therefore, impacts on channel velocities during maximum diversions and discharges were determined to be less than significant. See also response to Comment B6-31 below. The FOC terms developed after this comment was submitted include a requirement that Delta Wetlands conserve in perpetuity 200 acres of shallow-water rearing and spawning habitat as compensation for potential project effects on habitat.

B6-12. The biological opinions include terms that limit the effects of Delta Wetlands discharges on DO levels. See "Project Effects on Dissolved Oxygen Levels" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-13. See Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow", and Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

B6-14. See Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow", for a discussion regarding use of the Delta Wetlands Project for water transfers and water banking.

B6-15. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities". This discussion addresses the potential effects of boat use on aquatic and channel-island habitat and FOC measures designed to compensate for those effects. This master response also discusses additional proposed mitigation reducing the number of boat slips at recreation facilities; the measure would reduce the effects of construction and use of recreation facilities and of increased boating associated with the Delta Wetlands Project. Spills of fuel and other materials are discussed in Master Response 5 under "Demand for Sewage Facilities and the Potential for Accidental Spills". In addition, "Alteration of Habitat" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", lists the measures required by the biological opinions to reduce or compensate for changes in habitat that may result from the construction of recreation facilities and other project features (e.g., intake and discharge locations). See also response to Comment B7-64 for a discussion of the potential for predation at project recreation facilities.

B6-16. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

B6-17. The HMP developed by the lead agencies and DFG was designed to compensate fully for the effects of the proposed project on wildlife and wetland resources, including project effects on sandhill crane habitat. The proposed recreation facilities located on the eastern

one-third of Bouldin Island are considered part of the HMP, and their effects on sandhill cranes were evaluated during the HMP development process. Therefore, Delta Wetlands need not revise the proposed locations for these facilities.

B6-18. Activities of current and former landowners of the Delta Wetlands Project islands conducted under the Senate Bill (SB) 34 program are not part of the proposed project or project alternatives. For the purposes of the NEPA and CEQA analysis, the improved exterior levee slopes are considered an existing condition. As noted in Chapter 3G, "Vegetation and Wetlands", (see page 3G-10 of Chapter 3G of FEIS Volume 1) exterior banks with riprapped slopes that have been subject to recent maintenance generally would remain unvegetated under project conditions. The impact analysis did not include activities that already occurred under SB 34 because they are not part of the proposed project. Additionally, the lead agencies can require mitigation in the NEPA and CEQA documentation for the project only for those activities proposed by the project proponent and the activities over which the agency has jurisdiction in the CEQA/NEPA process.

B6-19. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

B6-20. DWR's status report "Procedure for Estimating the Environmental Impacts of Increasing Water Deliveries to State Water Project Service Areas" does not present a complete process for evaluating environmental effects of additional water deliveries; it describes the program being used to form this methodology. The growth-inducement analysis for the Delta Wetlands Project used a method for evaluating the quantitative relationship between population growth and water supplies known as the "population-supported" method documented in the DWR report. This method uses per capita estimates of water use to determine growth supported by a given volume of water, incorporating the assumption that a specific water volume can physically support a certain number of people per year. See Master Response 3, "Areas of End Use and Potential Growth-Inducement Effects of Delta Wetlands Water Deliveries".

B6-21. The analysis presented in the 1995 DEIR/EIS assumes that the recreation facilities on the Delta Wetlands Project islands would be privately owned and operated. The environmental effects on Delta resources of recreation activities and construction of facilities would not change if public recreation were provided under the adopted project. Under existing conditions, the Delta Wetlands Project islands provide few opportunities for public access and recreation (see pages 3J-3 through 3J-5 in Chapter 3J, "Recreation and Visual Resources", of the 1995 DEIR/EIS [pages 3J-4 through 3J-6 of FEIS Volume 1]). Implementing the Delta Wetlands Project would not reduce public access or recreation opportunities on the project islands; therefore, the lead agencies have not required that Delta Wetlands provide for public recreation as mitigation.

B6-22. The Delta Wetlands environmental research fund would contribute to research in the Delta. As described on page 2-9 of the 1995 DEIR/EIS (page 2-11 of FEIS Volume 1), the allocation of those funds would be under the direction of Delta Wetlands and a research

committee. In response to the commenter's question of an appropriate level of contribution, the Delta Wetlands environmental research fund is not designed to meet all or a major portion of the research needs in the Delta. By establishing this fund, Delta Wetlands contributes to state, federal, and private research in the Delta, but it should not be considered a major funding source. The partitioning of the fund for wildlife- and fishery-related research would be determined by Delta Wetlands and the research committee. The research committee is designed to act as a "grants committee" in determining where monies would be spent. This committee would be made up of representatives from DFG, USFWS, NMFS, the SWRCB, Delta Wetlands, fishery-oriented and waterfowl-oriented organizations, and one general environmental organization. No additional committee would be required.

B6-23. Measures to mitigate project impacts, including implementation of the HMP, have been made terms and conditions of any water right permit issued by the SWRCB for the Delta Wetlands Project. If Delta Wetlands transferred or sold the reservoir islands and associated appropriative water rights to another entity, the terms and conditions of the water right permits would still apply to the permitted project operations. It should be noted that the project is being analyzed as a stand-alone project and that no applications for the sale or lease of the project have been made. See also Chapter 2 of FEIS Volume 1.

B6-24. The development and maintenance of an inner levee system and the management of shallow water on the reservoir islands is considered part of the proposed project but is not required to compensate for loss of habitat under water storage conditions. See response to Comment B6-7 for more information.

B6-25. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

B6-26. The NEPA and CEQA analysis assumes that Delta Wetlands would not interfere with any of the following:

exercise of DWR's and USBR's water rights or those of any other senior water right holder;

compliance with the 1995 WQCP;

compliance with terms and conditions (e.g., take limits) specified in the biological opinions issued by NMFS and USFWS on the effects of SWP and CVP operations on winter-run chinook salmon and delta smelt; or

operation of upstream reservoirs.

See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, Including the CALFED Bay-Delta Program", regarding project effects on upstream reservoir operations and instream flows.

Additionally, as described in Chapter 2 of the 2000 REIR/EIS and of FEIS Volume 1, Delta Wetlands entered into stipulated agreements with both DWR and USBR during the 1997 water right hearing. These agreements describe how Delta Wetlands would operate independently without interfering with DWR's and USBR's operations of the SWP and CVP. The Delta Wetlands Project would not cause any aspect of SWP or CVP operations to change, except that some export pumping capacity that cannot be used by SWP and CVP base operations would be used to export Delta Wetlands discharges.

B6-27. See Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow", and Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

B6-28. Assuming closure of the temporary agricultural barriers would not change the impact conclusions identified in the 1995 DEIR/EIS. Hydrodynamic changes caused by Delta Wetlands Project operations would mainly occur in the channels immediately adjacent to the project islands and directly between the Delta Wetlands islands and the export facilities. The temporary agricultural barriers are essentially weirs that affect circulation in some south Delta channels, slowing the draining of the channels and maintaining channel stage to enable agricultural pumps to draw water. These barriers do affect south Delta hydrodynamics; however, the barriers are not located adjacent to the Delta Wetlands Project islands or on the main channels directly between the project islands and the export facilities and, therefore, would only minimally affect the hydrodynamic changes associated with Delta Wetlands Project operations. The assessment in the 1995 DEIR/EIS did assume operation of the barrier at the head of Old River, which has major effects on fisheries. Chapter 3F of the 1995 DEIR/EIS (see FEIS Volume 1) described the effects of operating this barrier, including the resulting Delta flow and transport conditions. Chapter 3F described mitigation to reduce this effect; this mitigation has been replaced by the FOC and biological opinion RPMs. Incorporating these measures into the proposed project reduces all fishery impacts to a less-than-significant level.

B6-29. See responses to Comments B6-11 and B6-31.

B6-30. Potential project impacts on water temperature, DO levels, and salinity are addressed by the FOC terms developed through the ESA consultation process. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-31. Impact D-4 on page 3D-15 of the 1995 DEIR/EIS (page 3D-17 in Chapter 3D of FEIS Volume 1) refers to the potential for effects on levee stability from erosion of levee toe berms caused by water movement at the siphon and pump stations. The term "toe berm", as defined in the glossary for the 1995 DEIR/EIS, refers to the broad bottom section of a levee that is used to steady the levee structure (see Figure 3D-2 in Chapter 3D). The design of the pump and siphon stations includes erosion-control elements such as expansion chambers and placement of riprap. Therefore, the potential for erosion of the levee toe

berms near the siphon and pump stations would be considered less than significant. See also Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

B6-32. As described in Chapter 3E of Volume 1 of this FEIS, electrical distribution lines would need to be relocated to the levee perimeters on Webb Tract as mitigation for inundation of the existing poles during water storage; they may also need to be expanded on the habitat islands to provide electrical service to the proposed project facilities. These distribution lines would be configured similarly to existing lines (see Figure 3E-3 in Chapter 3E) and usually would be located on top of the islands' perimeter levees.

Presumably, some level of waterfowl mortality is currently attributable to bird strikes on existing transmission lines. Although the frequency of bird strikes under existing conditions is unknown, resulting waterfowl mortality is probably not substantial under existing conditions.

On the habitat islands, the extension of electrical lines on levees, coupled with expected increases in waterfowl use, could increase the frequency of bird strikes under project conditions. The level of associated waterfowl mortality, however, is not expected to be significant because waterfowl in the Delta typically flare away from levees when flying to or from islands, thereby reducing the likelihood of bird strikes on lines located on the perimeter levees. Also, human activity along levees (e.g., automobile use, maintenance activities, presence of hunters, presence of recreation facilities) would be greater under project conditions and would tend to keep waterfowl away from the levee tops. Waterfowl strikes on transmission lines are expected to be less frequent on the reservoir islands than on the habitat islands under project conditions because substantially fewer waterfowl are expected to use the reservoir islands. Because bird strikes are not expected to be a significant source of waterfowl mortality, construction of brood ponds to offset potential mortality associated with bird strikes is not required.

B6-33. The contribution of Delta Wetlands Project operations to entrainment of striped bass eggs, larvae, and juveniles was addressed in Impacts F-5 and F-7. The 1995 DEIR/EIS included mitigation measures to reduce these impacts to a less-than-significant level. These measures have been replaced by the terms of the biological opinions, which are now incorporated into the project description. Although striped bass were not formally addressed during the federal and California ESA consultation process, the measures adopted in the biological opinions reduce project effects on striped bass and other species. See "Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows, Downstream Transport, Area of Optimal Salinity Habitat, and Entrainment" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-34. The purpose of the environmental impact analysis is to identify significant environmental impacts associated with implementing the proposed project. Therefore, the modeling of Delta Wetlands Project operations used a "worst-case" scenario under which all water

discharged by the Delta Wetlands Project was simulated as being exported through the SWP and CVP pumps. See also Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow".

Additionally, as part of the consultation process for compliance with both the federal and California ESAs, USACE, the SWRCB, NMFS, USFWS, DFG, and Delta Wetlands agreed on the project operating parameters referred to as the FOC. The FOC, which have been incorporated into the proposed project, more closely define the operations of the proposed project. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-35. As described on page 2-15 in Chapter 2 of the 1995 DEIR/EIS (page 2-17 of FEIS Volume 1), the difference between water budget terms under the No-Project Alternative and existing conditions is not discernable in modeling of water operations and, therefore, no distinction is made between water budgets for existing conditions and the No-Project Alternative. As explained further on page 3A-9 of the 1995 DEIR/EIS (page 3A-10 in Chapter 3A of FEIS Volume 1), Delta water supply under existing conditions, which include agricultural land uses on the Delta Wetlands Project islands, is similar to the water supply under the No-Project Alternative; the estimated changes in consumptive water use between the existing agricultural land uses and the intensified agricultural uses under the No-Project Alternative (estimated to be as much as 30 thousand acre-feet per year (TAF/yr), as shown in Table 2-2 in FEIS Volume 1, Chapter 2) are not measurable at the scale of monthly water supply modeling. Therefore, rather than presenting two lists of the same values for existing Delta water supply conditions and the No-Project Alternative conditions, the NEPA and CEQA analysis describes the simulation result for the No-Project Alternative only.

B6-36. Information is not available that clearly supports the assumption that optimal rearing habitat is equivalent to shallow shoal habitat. To address concerns about optimal salinity habitat, DFG, NMFS, and USFWS included in the FOC several terms that directly limit the change in the location of X2 that Delta Wetlands diversions would be allowed to cause and that require Delta Wetlands to conserve in perpetuity 200 acres of shallow-water rearing and spawning habitat. These terms are described generally in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", and are detailed in response to Comment A7-3.

B6-37. See "Alteration of Habitat" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for a discussion of habitat replacement and limitations on construction. If the lead agencies approve Delta Wetlands' permit applications, Delta Wetlands will be required to implement the terms of the biological opinions as part of its operating conditions.

B6-38. DFG's concerns about the proposed project's effects on channel temperatures and DO levels are addressed by the FOC. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-39. Conditions immediately before the February–June period are shown in the biological assessment (Appendix F2 of the 1995 DEIR/EIS). Effects of the shift in X2 are described in the 1995 DEIR/EIS on pages 3F-22 and 3F-23 and under Impact F-7 (see pages 3F-25 and 3F-26 in Chapter 3F of FEIS Volume 7). The FOC terms that limit project effects on X2 are described generally in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", and are detailed in response to Comment A7-3.

B6-40. As described in the 1995 DEIR/EIS, Delta Wetlands Project discharges would not affect Sacramento River or San Joaquin River inflow to the Delta. See response to Comment A2-5 regarding the salmon mortality index. The potential effects of project operations on chinook salmon are addressed fully in the DFG and NMFS biological opinions on the project.

B6-41. The risk of additional entrainment that may result from a shift in the location of optimal salinity habitat was included in the evaluation of downstream transport (Impact F-5) and increased entrainment loss of striped bass and delta smelt (Impact F-7). Both impacts were determined to be significant and mitigation was recommended. The commenter's assumption that benefits of Alternative 1 are overstated is incorrect; see response to Comment B6-35 regarding the similarity between water budget terms under the No-Project Alternative and existing conditions. Increases in outflow that may result from discontinuing agricultural diversions would have minimal effects on the availability of optimal salinity habitat. More important are the geographic location of the optimal salinity range and the shifts caused by Delta Wetlands diversions.

The mitigation proposed in Chapter 3F has been replaced by the terms of the biological opinions, which are now incorporated into the project description; see Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions". See response to Comment A7-3 for details about FOC restrictions on changes in X2 attributable to project operations.

B6-42. By definition, the lower San Joaquin River is upstream of the confluence with the Sacramento River and downstream of the confluence with the Mokelumne River (see the description of methods for evaluating transport effects in Appendix F2 of the 1995 DEIR/EIS). Available information indicates that few striped bass spawn in the San Joaquin River upstream of the Delta (California Department of Fish and Game 1992). Nevertheless, the analysis of transport conditions determined that impacts of Delta Wetlands operations would be significant (Impact F-5), and mitigation was proposed to reduce the impact to a less-than-significant level. This mitigation has been replaced by the terms of the biological opinions, which are now incorporated into the project description; see Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-43. Available information does not indicate that existing Delta diversions and exports significantly affect American shad (i.e., substantially reduce population abundance).

Delta Wetlands diversions would minimally increase entrainment of American shad during August–October. American shad present in the Delta during this period would likely avoid entrainment in project diversions because the project intakes would be equipped with effective fish screens. As discussed on page 3F-22 of Chapter 3F of the 1995 DEIR/EIS (page 3F-24 of FEIS Volume 1), most American shad enter the Delta from the Sacramento River, and Delta Wetlands diversions would not affect the flow division between the Sacramento River, the DCC, and Georgiana Slough.

The FOC diversion and discharge restrictions that have been incorporated into the project description reduce project effects on American shad, as well as other species. See "Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows, Downstream Transport, Area of Optimal Salinity Habitat, and Entrainment" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-44. To address concerns about optimal salinity habitat, DFG, NMFS, and USFWS included in the FOC several terms that directly limit the change in the location of X2 that Delta Wetlands diversions would be allowed to cause. These terms are described generally in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", and are detailed in response to Comment A7-3.

B6-45. The commenter's concerns about project effects on longfin smelt have been addressed by the FOC measures to protect listed species. See response to Comment A5-6 and Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-46. The Delta Wetlands Project, as described in the 1995 DEIR/EIS, would not affect Sacramento River or San Joaquin River inflow to the Delta. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

B6-47. The biological opinions address all potential impacts on listed species identified by USFWS, NMFS, and DFG; the restrictions on project operations (the FOC and RPMs) described in the biological opinions also provide protections for nonlisted species. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-48. Mitigation Measure F-4, "Operate the Delta Wetlands Project under Operations Objectives that Would Minimize Adverse Transport Effects on Striped Bass, Delta Smelt, and Longfin Smelt", proposed in the 1995 DEIR/EIS to address Impact F-5, "Reduction in Downstream Transport and Increase in Entrainment Losses of Striped Bass Eggs and Larvae, Delta Smelt Larvae, and Longfin Smelt Larvae", has been replaced by several diversion criteria included in the FOC and in DFG's RPMs. These measures, which have been incorporated into the project description, reduce effects on striped bass, delta smelt, longfin smelt, American shad, and other species to a less-than-significant level. See

"Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows, Downstream Transport, Area of Optimal Salinity Habitat, and Entrainment" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-49. The CALFED Ops Group is charged with coordinating the operations of the state and federal water projects within the requirements set forth in the June 1994 Framework Agreement, December 1994 Accord, and 1995 WQCP. Inherent in this responsibility is the need to coordinate activities that may have some bearing on program objectives, which include operating water projects in compliance with the water quality objectives and coordinating ESA issues.

Because Delta Wetlands Project operations are integrally tied to the water quality standards and operations of the SWP and CVP, Delta Wetlands operations would need to be coordinated with the CALFED Ops Group. Project operations would need to be planned based on knowledge of SWP and CVP operations. Furthermore, Delta Wetlands would have to work with the Ops Group to coordinate the export of project discharges. The Ops Group might also take advantage of opportunities to use Delta Wetlands' facilities and water to meet its objectives by directly purchasing, borrowing, or trading Delta Wetlands water, or by temporarily using storage capacity (see Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program"). The Ops Group could also provide Delta Wetlands with sanctioned accounting of Delta water and information from real-time monitoring. Coordination between Delta Wetlands and the Ops Group would enhance information sharing with all Delta projects.

The Delta Wetlands Project could be integrated directly into the Ops Group by participating in monthly meetings and working with the group to meet shorter term needs. The participation of Delta Wetlands, like that of other nonstate and nonfederal entities, would be voluntary. Delta Wetlands would be expected to provide a short summary of project operations in the monthly meeting. During the meetings, Delta Wetlands and the CALFED agencies' designated representatives could initiate agreements that would change Delta Wetlands operations to accommodate CALFED's needs. Delta Wetlands could also participate in various working-level subgroups to address operational, biological, or other technical issues that may face Delta Wetlands and the Ops Group.

B6-50. Delta Wetlands Project impacts on optimal salinity habitat were evaluated in the 1995 DEIR/EIS based on a methodology that recognized a significant relationship between indices of fish abundance and the availability of optimal salinity habitat. To address concerns about optimal salinity habitat, DFG, NMFS, and USFWS included in the FOC several terms that directly limit the change in the location of X2 that Delta Wetlands diversions would be allowed to cause. These terms are described generally in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", and are detailed in response to Comment A7-3.

B6-51. As noted in Chapter 3F, "Fishery Resources", entrainment in SWP and CVP diversions has been high during periods of initial high Delta inflows in October–January. However, information is not available to substantiate the comment that when X2 is near Collinsville, striped bass and delta smelt will be in the Delta and vulnerable to entrainment. During fall, juvenile American shad and other fish species are large enough to be screened from diversions, although they are likely to be impinged. See also response to Comment B6-43 regarding entrainment of American shad.

The mitigation measure referred to by the commenter (F-4) was proposed to address Impact F-5, "Reduction in Downstream Transport and Increase in Entrainment Loss of Striped Bass Eggs and Larvae, Delta Smelt Larvae, and Longfin Smelt Larvae". Impact F-5 and Impact F-8, "Increase in Entrainment Loss of Juvenile American Shad and Other Species", are now addressed by several FOC terms and RPMs, which have been incorporated into the proposed project. See "Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows, Downstream Transport, Area of Optimal Salinity Habitat, and Entrainment" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-52. The lead agencies note that the DFG comments on Alternative 1 apply to Alternative 2 as well. See responses to Comments B6-1 through B6-51.

B6-53. See response to Comment A4-7.

B6-54. The DFG, NMFS, and USFWS biological opinions provide a comprehensive mitigation program to reduce all potential project effects on aquatic resources to a less-than-significant level. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-55. As stated in the comment, DFG assessed the performance of the HMP for all waterfowl evaluation species. The process used by the HMP team to evaluate habitat values created by habitat island designs is described on pages 3H-11 and 3H-12 of the 1995 DEIR/EIS (page 3H-13 of FEIS Volume 1) under "Use of HEP Results". The 1995 DEIR/EIS (page 3H-11) acknowledged that waterfowl habitat value would be enhanced by the management of shallow-water habitat on the reservoir islands during periods of nonstorage (see page 3H-13 of FEIS Volume 1); however, the HMP team did not consider those values to offset project impacts because future habitat conditions on the reservoir islands are unpredictable.

B6-56. The management of shallow water on the reservoir islands is considered part of the proposed project but is not required to compensate for loss of habitat, including tundra swan habitat, under water storage conditions. See response to Comment B6-7 for more information.

Reference to a shallow-storage condition without an inner levee system has been deleted. If Delta Wetlands chooses to create shallow-water habitat, water would be managed to control outbreaks of botulism. The second sentence on page 3H-14 of the 1995 DEIR/EIS

under "Shallow-Storage Conditions" (see page 3H-15 of FEIS Volume 1) is revised as follows:

> Habitat conditions would be similar to those described for shallow-water wetlands (see below) except that the availability of wildlife forage would be lower during storage periods that were not preceded by 60 days of nonstorage.

B6-57. Management and infrastructure associated with shallow-water wetlands are described on pages 2-8 and 2-9 of the 1995 DEIR/EIS (page 2-10 of FEIS Volume 1) under "Shallow-Water Management on the Reservoir Islands" and on pages 3H-14 and 3H-15 of the 1995 DEIR/EIS (pages 3H-15 and 3H-16 of FEIS Volume 1) under "Shallow-Water Wetland Conditions". See responses to comments B6-7, B6-55, and B6-56 above.

B6-58. Eight marinas in the Delta were surveyed to determine the percentage of boat-slip occupancy and peak use. The total number of occupied boat slips at each marina varied between 10% and 70%. As a conservative measure, it was assumed that 70% of the boat slips (i.e., 798 of 1,140) would be occupied at the recreation facilities under Delta Wetlands Project operations. The results of this estimate are consistent with analyses of other marinas in the project area. See also response to Comment B5-8.

B6-59. The lead agencies understand that Delta Wetlands and DFG are working toward completion of an agreement under Fish and Game Code Section 2081 of the California ESA and that this agreement addresses DFG's concerns as raised in this comment letter.

B6-60. The basic fish screen design proposed by Delta Wetlands was described in Appendix 2 of the 1995 DEIR/EIS. DFG, NMFS, and USFWS subsequently considered fish screen design and operation criteria in the federal and California ESA consultation. These agencies specify all their requirements for design and operation procedures for Delta Wetlands' fish screens in their biological opinions for the Delta Wetlands Project.

The FOC terms include general guidelines for the design of fish screens. The guidelines state that the fish screens "will be generally consistent with the design presented in the [1995] DEIR/EIS" except that they will be required to meet the criteria for an approach velocity of 0.2 fps. To maintain the 0.2-fps approach velocity, there must be adequate hydraulic control and debris cleaning systems; the final fish screen design will describe such systems. The FOC terms require that USFWS, NMFS, and DFG concur with the final design and installation guidelines adopted by Delta Wetlands. Delta Wetlands must submit the final fish screen design, including a monitoring program to evaluate performance criteria, to the resource agencies for approval at least 90 days before beginning to operate.

The RPMs in the NMFS and DFG biological opinions require that the resource agencies approve the final design, construction schedule, and maintenance plan for the fish screens. The NMFS biological opinion includes the following RPM:

> Measures shall be taken to reduce the extent of entrainment and predation during Delta Wetlands diversion operations through the use of properly designed fish screens.

This RPM requires that the final fish screen design and construction schedule be submitted to the NMFS Southwest Region for review and acceptance before construction begins. The screen design must meet or exceed the NMFS Southwest Fish Screening Criteria for Anadromous Salmonids. At least 2 months before construction begins, Delta Wetlands must submit to NMFS a hydraulic monitoring program that evaluates the performance of the fish screens. Additionally, Delta Wetlands must submit to NMFS a proposed operations and maintenance plan that includes the following components, as stated in the RPM:

1) periodic underwater inspections;

2) periodic hydraulic measurements; [and]

3) periodic assessment of screen performance—component reliability, component durability, and screen-cleaning system effectiveness.

To document compliance with this RPM, Delta Wetlands must also submit an annual report to NMFS.

DFG's biological opinion (RPM 12.0) requires that Delta Wetlands' fish screens comply with DFG's fish screen policy and that Delta Wetlands develop a "Fish Screen Test Plan" and a "Fish Screen Maintenance Plan"; both of these plans must be approved by DFG. The effectiveness of cleaning methods would have to be determined through monitoring. Diversions would need to be reduced or eliminated if it is found that cleaning does not maintain the screen approach velocity within the criteria of the fish screen construction and monitoring plan.

The full texts of the FOC and the DFG, NMFS, and USFWS biological opinions are provided in Appendices B, C, D, and E, respectively, of the 2000 REIR/EIS.

B6-61. The commenter is correct in noting that Table 2 of Appendix B of the biological assessment incorrectly duplicates the information in Table 3. The corrected data was transmitted to DFG during the consultation process.

B6-62. See response to Comment B6-47.

B6-63. The measures included in the DFG, NMFS, and USFWS biological opinions reduce project impacts on fisheries to a less-than-significant level. All reservoir flooding scenarios described in Appendix G2 of the 1995 DEIR/EIS would be subject to the diversion and discharge restrictions described in the FOC and biological opinions. See

Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B6-64. The commenter is referring to the assumptions used in the 1995 DEIR/EIS analysis to predict vegetation conditions on the reservoir islands under each project alternative.

To predict future vegetation conditions, it was necessary to make an assumption regarding which storage conditions could trigger the creation of shallow-water wetlands to provide desirable habitat conditions for wildlife. As described on page G2-2 of Appendix G, shallow-water wetlands would be created only in years when there had been no storage for 60 or more consecutive days during the growing season (July 15–September 30). Although some forage would be produced under shallow-storage conditions, a period of nonstorage would allow for substantial production of waterfowl forage. Additionally, dry soil conditions might be needed to provide access to the island interiors for repair of inner levees and water control structures damaged by previous deep-water storage. Therefore, the assumption on page G2-2 is correct in defining the 60 consecutive days as "nonstorage". During project operations, Delta Wetlands may create shallow-water wetlands after periods of nonstorage of shorter or longer duration, depending on the timing of reservoir drawdowns and annual conditions.

The management of shallow water on the reservoir islands is considered part of the proposed project but is not required to compensate for loss of habitat under water storage conditions. Therefore, flooding of the reservoir islands to create shallow-water wetlands during periods of nonstorage would occur at the discretion of Delta Wetlands. See response to Comment B6-7 for more information.

B6-65. As noted by the commenter, the inner levee systems on the reservoir islands are part of the proposed project. The text on page G2-3 of Appendix G is correct, but the reference to inner levee systems not being constructed was meant to refer to situations in which the inner levee system would have been damaged as a result of previous storage events. See also response to Comment B6-7.

B6-66. The HMP monitoring program is described on pages 15–23 of Appendix G3. Appendix G3 of the 1995 DEIR/EIS states on page 16, "Approximately 2 years are estimated for completion of construction (i.e., monitoring years -1 and 0)". In this reference, monitoring year -1 is the first year of construction and monitoring year 0 is the second year of construction.

B6-67. Monitoring requirements for wildlife species protected by the California ESA, including sandhill cranes, are described on pages 22 and 23 of the HMP (Appendix G3). Monitoring requirements, performance standards, and potential remedial measures for greater sandhill cranes and Swainson's hawks will be developed by DFG (the commenter) in consultation with Delta Wetlands as described in DFG's biological opinion for the Delta Wetlands Project in accordance with the California ESA. See page 48 of Appendix C of the 2000 REIR/EIS.

B6-68. Methods that may be used to establish riparian vegetation on the habitat islands are described on page G5-9 in Appendix G5, "Summary of Jurisdictional Wetland Impacts and Mitigation". These methods do not preclude use of other techniques, including excavating existing grades so that the relationship between soil surface and groundwater elevations is appropriate for establishment and natural regeneration of riparian vegetation.

B6-69. Page G5-10 in Appendix G5 describes proposed methods to establish freshwater marsh on the habitat islands. Delta Wetlands will be required to comply with the performance standards outlined in the HMP and with the mitigation developed in consultation with USACE to offset project effects on jurisdictional wetlands. The description given in Appendix G5 does not preclude the use of other techniques for establishing the freshwater marsh areas, as long as the performance standards and mitigation requirements are met.

B6-70. Results of greater sandhill crane and Swainson's hawk surveys conducted in 1987 on Webb Tract are presented in Appendix H2, "Wildlife Inventory Methods and Results", on page H2-13. The recent survey information collected by DFG has been noted. The 1997 biological opinion issued by DFG for the Delta Wetlands Project addresses project effects on greater sandhill crane and Swainson's hawk. A copy of the biological opinion was included in the 2000 REIR/EIS.

B6-71. In its wildlife species list benefits/impacts summary, DFG identifies 22 species of birds and mammals that, in its determination, would be adversely affected by implementation of the Delta Wetlands Project. These species are all associated primarily with herbaceous and agricultural habitats that dominate the Delta Wetlands Project islands under existing conditions. The 1995 DEIR/EIS, on page 3H-21 under "Impact H-1: Loss of Upland Habitats" (see page 3H-23 of FEIS Volume 1), acknowledges that there would be a net loss in acreage of upland habitat. Implementation of the HMP would partially offset these impacts by creating fewer, but higher quality, upland habitats. Therefore, although these species would be adversely affected by the Delta Wetlands Project, the impact would be less than significant. This determination is consistent with DFG's conclusion noted in footnote 2 to the table ("Remaining impacts are judged to be less-than-significant").

State of California

Letter B7
The Resources Agency

Memorandum

Date : DEC 2 1 1995

To : Jim Sutton
State Water Resources Control Board
Post Office Box 2000
Sacramento, California 95812-2000

From : Department of Water Resources

Subject : Draft Delta Wetlands Project EIR/EIS

The Department of Water Resources is providing these comments to you after reviewing the draft Environmental Impact Report/Environmental Impact Statement for the proposed Delta Wetlands project. While we feel that the overall technical studies and analyses contained in the document are satisfactory, the Department has several major concerns which are not addressed adequately in the current document. These concerns are outlined below:

1. The operation of the Delta Wetlands project may adversely affect or compromise the water rights of the State Water Project and other more senior water rights holders in the Bay-Delta system.

   Delta Wetlands proposes to divert "surplus" water flowing through the Delta into storage. However, given the complexity of factors affecting conditions in the Bay-Delta estuary, it is extremely difficult to distinguish surplus water from that which is needed to meet Bay-Delta standards, export needs and needs of in-Delta water users. The DEIR/S does not contain adequate information nor a sufficient level of detail on how the project would be operated to determine how the project will impact DWR water rights and SWP operation. **B7-1**

   A related concern is the probable incremental effect of DW project operations on Bay-Delta aquatic species. The proposed mitigation measures to minimize potential effects of DW rely heavily on the success of unproven technology. We are concerned that any incremental adverse impacts caused by DW will not be adequately mitigated by DW and a result would be additional, restrictive regulations affecting the water supply reliability of the present SWP system. **B7-2**

2. The DEIR/S does not address the effect of the DW project on implementation of the Interim South Delta Program, a reasonably anticipated future project. This program, proposed jointly by DWR and the U.S. Bureau of Reclamation, currently envisions constructing and operating four flow control structures in the south Delta, channel dredging in Old River,constructing a new intake gate at **B7-3**

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the northeast corner of Clifton Court Forebay, and increasing diversions into Clifton Court Forebay above the current allowable level. **B7-3 cont'd**

3. Available data indicate that peat soil leaching, which would occur as the Delta Wetlands islands are alternately filled and drained, may result in elevated levels of THM precursors in southern Delta waters. This increase in THM precursors could have a significant effect on the cost and feasibility of meeting increasingly stringent drinking water quality standards set by the U.S. Environmental Protection Agency for water supplies delivered by the SWP to our municipal and industrial contractors. This concern has not been adequately addressed in the DEIR/S. **B7-4**

4. On December 15, 1994, representatives from the State of California, the federal government and stakeholders representing urban, agricultural, and environmental interests signed the Bay-Delta Accord. Included as a provision of this historic agreement was the formation of a joint State-federal task force to determine a long-term solution for the variety of issues affecting public resource values of the Bay-Delta estuary. Over the last year, this effort has evolved into the creation of the Bay-Delta Advisory Council and the CALFED Bay-Delta Program. This process is designed to identify future long-term Bay-Delta facilities and actions to protect the water supply reliability and ecosystem values of the Bay-Delta. The DEIR/S does not identify the relationship or compatibility of the Delta Wetlands project with the CALFED Bay-Delta Program. **B7-5**

6. The DEIR/S indicates that Division of Safety of Dams requirements may result in project storage elevations of less than six feet above mean sea level. According to Section 6004(c) of the California Water Code, any levees within the Sacramento-San Joaquin Delta which impound water to an elevation greater than four feet above mean sea level (1929 datum) are under the jurisdiction of the Department's Safety of Dams. The DEIR/S must clarify the proposed design to determine whether the DW project will be regulated by Safety of Dams. **B7-6**

The attached detailed comments on various aspects of the DEIR/S provide specific information in support of these more general operational and policy-oriented concerns made here. I trust that you will find these comments useful in evaluating and responding to the Department's concerns about DW and the DEIR/S.

Beyond this EIR/S process, the Department intends to actively participate in any water rights hearings on the Delta Wetlands project. DWR hopes that the hearings will address more specifically how surplus water will be determined and the project operated so that senior water rights holders are not harmed.

If you have any questions, please contact me or have your staff contact Stein Buer of my staff at (916) 653-6628.

Kathlin R. Johnson

Kathlin R. Johnson
Chief, Division of Planning
(916) 653-1099

Attachment

Comments on the Delta Wetlands Project Draft EIR/EIS by DWR Staff

The following compilation includes comments by the Division of Local Assistance, the Division of Operations and Maintenance, the Division of Planning, and the Environmental Services Office.

Division of Local Assistance

The following sections of the draft Delta Wetlands Environmental Impact Report and Environmental Impact Statement were reviewed with focus on the impacts from the DW project discharges on TOC/DOC and THM concentrations in Delta exports:

Chapter 2.	Delta Wetlands Project Alternatives
Chapter 3C.	Affected Environment and Environmental Consequences - Water Quality
Appendix C1.	Analysis of Delta Inflow and Export Water Quality Data
Appendix C2.	Analysis of Delta Agricultural Drainage Water Quality Data
Appendix C3.	Water Quality Experiments on Potential Sources of Dissolved Organics and Trihalomethane Precursors for the Delta Wetlands Project
Appendix C4.	Delta DWQ: Delta Drainage Water Quality Model
Appendix C5.	Modeling Trihalomethane Concentrations at a Typical Water Treatment Plant Using Delta Export Water

GENERAL COMMENTS

In summary, the DEIR/EIS analysis of impacts to water treatment plants in meeting TOC/DOC and THM standards by Jones & Stokes Associates, Inc. is incomplete. The analysis and mitigative measures were based on the current U.S. Environmental Protection Agency THM standard of 0.100 mg/L. Proposed lower THM MCLs for 1998 and year 2002 under the D-DBP Rule were not considered. The modeled results of the predicted impacts of the DW project in future years with respect to water treatment plants in meeting the proposed water quality standards must also be evaluated. B7-7

Some of the interpretations of water quality data and relationships between water quality parameters (e.g., EC and DOC) identified by Jones & Stokes are not fully supported. For example, Jones & Stokes use drainage water EC to predict the concentration of DOC from nonevaporative processes (e.g., peat soil, decaying crops). Yet, there are data in the report that show this relationship cannot be consistently used since DOC is not conservative when applied on Delta soils. B7-8

Unobserved changes in the experimental wetlands water concentrations of inorganic variables, such as EC, TDS, sodium, chloride, and bromide, were interpreted by Jones & Stokes to mean that peat soil leaching was insignificant during the flooding and storage of water in a wetland. Our analysis of their THM yield data showed the contrary. Peat soil leaching appears to be a significant contributor of THM yielding organic matter to flooded wetlands and seasonally stored water. B7-9

Results from the Department of Water Resources' Municipal Water Quality Investigations Program, do not fully concur with the Jones & Stokes recommendation to use UVA-254nm measurements in lieu of TOC measurements to manage DW project discharges to achieve less than significant impacts. For regulatory monitoring, the degree of precision and accuracy needed for TOC data cannot be consistently achieved by UVA measurements. New field automated TOC analyzers are, however, available. B7-10

And finally, the method of analysis employed in the DEIR/EIS consisted of a series of modeled assumptions and data, with each result serving as input to another model or computation. The results of small scale experiments were used to provide insight and prediction of the impacts of the full scale DW project. Jones & Stokes assumed a 10 percent error throughout their process. There was no evaluation of the data to test this assumption. B7-11

The DEIR/EIS needs to be revised with the additional analysis and corrections stated above in the general comments and below in the specific comments to become complete.

SPECIFIC COMMENTS

Comments on Chapter 2. Delta Wetlands Alternatives

The statement that the DW project would increase the availability of "high quality water in the Delta for export" (pg. 2-1) is not supported. More water might be available but could result in significant elevations in DOC, THM, SS, DO, chlorophyll, and temperature in Delta channel waters and exports unless DW project discharges are adjusted (Chapter 3C Summary). DW project water is not of high quality since the discharge must be diluted in the channels to have less than significant levels of impact on receiving water quality. B7-12

While there are two islands established as wetlands to compensate for ecological impacts, there is no compensation for the potential detrimental impacts on drinking water supplies and water treatment from increased DOC and THMFP (pg. 2-1). B7-13

Comments on Chapter 3C. Affected Environment and Environmental Consequences - Water Quality

In the final analysis, the Jones & Stokes predicted impacts and significance on water quality are based on the results of a series of computer model simulations and rough assumptions on the behavior of chemical constituents and hydrodynamics in the Delta. The output from one model or assumptions from a computation serve as input for another model or computation. The limitations and errors of each model are further compounded in subsequent limitations and errors of the next model that is used. The results are presented in a manner as to lead the reviewers into believing that there is great precision and accuracy in the predictive capabilities of each of the models used and in the assumptions. Jones & Stokes assumed measurement errors and modeling uncertainties are about 10 percent of the measured or modeled values (pg.3C-21). Jones & Stokes' reasoning for such a high degree of confidence given to the modeling uncertainties are not explained. We have not yet seen a model with that can be given such a high degree of confidence in results. B7-14

The analysis of potential impacts from the DW project discharges on future drinking water TOC and THMFP control are significantly underestimated (pg. 3C-28 Trihalomethane Concentrations in Treated Drinking Water). The current U.S. EPA drinking water THM MCL of 0.100 mg/L was used as the benchmark for comparison (pg. 3C-29). The new proposed THM MCL will lower the limit to 0.080 mg/L by June 1998 and to 0.040 mg/L by year 2002 under the D-DBP (Disinfectants Disinfection By-Products) Rule. If the new rule is considered in the impact analysis, the criteria used by Jones & Stokes to determine significant impacts to drinking water becomes exceedances of 90 percent of the proposed 0.080 mg/L THM standard (72 ug/L) or an increase of 20 percent of the proposed THM standard (16 ug/L) in 1998. Their criteria becomes more restrictive in year 2002 with exceedances of 90 percent of the proposed 0.040 mg/L THM standard (36 ug/L) or an increase of 20 percent of the proposed standard (8 ug/L). Therefore, the negative effect of the discharge upon the ability to meet proposed drinking water standards will become much more significant and frequent in the very near future. The impacts could result in additional treatment costs. B7-15

The D-DBP Rule also places restrictions on the formation of haloacetic acids. Haloacetic acids were not discussed or studied in the DEIR/EIS. The proposed MCL for five specified HAAs is 0.060 mg/L by June 1998 and 0.030 mg/L by year 2002. B7-16

The impact of increased TOC concentration on the degree of additional removal required by enhanced coagulation under the new rule was also omitted. Depending on the amount of TOC concentration increase caused by the discharge and the resulting source water TOC concentration that occurred, the TOC removal requirements at a water treatment plant could increase by as much as 10 percent (assuming the same water alkalinity). B7-17

Jones & Stokes needs to incorporate the future THM, HAA5, and TOC regulations in their environmental impact analysis. Figure 3C-19 showed that monthly THM concentrations under Alternative 1 were simulated to be greater than 90 ug/L only for 1977, and the change in THM concentrations were always simulated to be less than 20 ug/L (pg. 3C-29). The same figure showed monthly THM concentrations under Alternative 1 were simulated to be greater than 72 ug/L (the significance criteria for the proposed 1998 THM MCL) in years 1969,76-79,83-84,89,90-91 and greater than 36 ug/L (the significance criteria for the proposed year 2002 THM MCL) in all years simulated, 1967-91. The change in THM concentrations were simulated to be more than 16 ug/L (year 1998 criteria) and 8 ug/L (year 2002 criteria) in 1977 and 1978. The model simulations show that final THM concentrations under any of the alternatives including the No Project - Intensive Agriculture option will exceed the proposed year 2002 THM standard of 40 ug/L. Therefore, the longevity of the Delta Wetlands Project may be short-lived with respect to not significantly impairing the drinking water quality of Delta exports. B7-18

DWR does not support the Jones & Stokes recommendation to monitor Delta Wetland DOC discharges and river DOC by UVA-254nm measurements (pg. 3C-28; 3C-30). While there is a correlation between UVA-254 nm values and DOC, the relationships vary seasonally and with location. Since the TOC concentration of source water is regulated under the D-DBP Rule, TOC is the preferred parameter that should be monitored. Recent advances now make field determinations of TOC simple, fast, and without the need for a laboratory. New instrumentation has been tested by DWR for automated remote sensing of TOC in channels and drains for the MWQI program. B7-19

UVA-254nm measurements within certain DOC ranges may give good approximations of DOC but may not meet the accuracy desired in most regulatory monitoring programs. DWR and other water agencies measure both UVA-254nm and DOC to assess the humic nature of DOC by comparing the specific UV absorbance (UVA-254nm : DOC ratio). Field automated TOC analyzers are commercially available for rapid determinations and are the preferred method for more accurate organic carbon measurements.

Mitigation Measure C-6 (pg. 3C-29) and definition of an allowable DW discharge (pg. 3C-30) should be modified with inclusion of the proposed year 1998 and 2002 THM standards. Table 3C-5 should similarly be updated to define the significance thresholds for THM. B7-20

Appendix C1. Analysis of Delta Inflow and Export Water Quality Data

Jones & Stokes concluded that the statistics of the monthly samples were not substantially different from those of the entire set (pg. C1-5; table C1-1). Did the data support the assumption stated on page 3C-21 that the measurement errors and B7-21

modeling uncertainties are about 10 percent of the measured or modeled values? Does the term "not substantially different" mean not statistically different? B7-21 cont'd

Appendix C2. Analysis of Delta Agricultural Drainage Water Quality Data

Under the MWQI program, DWR has completed work on commercially available field UVA-254nm and automated TOC analyzers for monitoring Delta drainage and river water. Automated TOC analyzers will be added to existing remote telemetered flow and water quality stations in the Delta if the results from a one-year pilot study are successful (pg. C2-10).

We are not convinced of Jones & Stokes' conclusion that the expected drainage DOC concentration, based on the measured EC value, can be used to estimate the net increase of DOC concentration in each drainage sample (pg. C2-7; C2-10; Summary of Agricultural Drainage Data Analysis). DOC is not conservative when applied to microbially active soils. DOC is a variable complex mixture of organic matter undergoing varying rates of decay. EC is a physical measurement related to a mixture of ionic salts, some that react with soil minerals (e.g, ion exchange, chemical precipitation). Can Jones & Stokes provide references to other studies that have found or used their hypothesized EC to DOC relationship? B7-22

Their statement (pg. C2-9) that, "Interestingly, some islands have average drainage DOC concentrations that are less than the values expected based on the average EC increase, suggesting that some of the applied DOC is adsorbed, retained, or otherwise lost from the drainage on these islands" shows that EC and DOC behave dissimilarly and questions the reliability of using measured EC values to estimate net increases in DOC. Organic matter in DOC applied to fields is not conservative. Organic matter is lost through decomposition and photoreactions. Studies of the degradation of organic matter (e.g., peat soils) in the Delta were described on page C3-5. DWR has also estimated DOC loss (applied water DOC mass load greater than drainage water DOC mass load) on mineral soil islands (DWR, 1994). B7-23

The soil DOC balance equation in figure C2-1 should add a term for Loss Processes (microbial decay, photoreactivity). B7-24

The soil salt balance equation in figure C2-1 should include a term for Net Ion Exchange and Loss from Salt Precipitation Processes. B7-25

The relationships among UVA-254nm, DOC, C-THM (TFPC), THM, and other water quality constituents were reported in the annual report of the MWQI program for 1990 (DWR, 1993), and five-year report (DWR, 1994). Depending on the level of accuracy required for THMFP concentrations, simple UVA and DOC measurements may not be preferable to THMFP tests (pg. C2-10). B7-26

Appendix C3. Water Quality Experiments on Potential Sources of Dissolved Organics and Trihalomethane Precursors for the Delta Wetlands Project

A fully flooded peat island water storage pilot study was unable to be conducted. Small scale experiments, such as the vegetative decay in barrels, ponded wetland, and soil water extraction tests, provided some valuable information and insight about decaying plant and soil contributions of DOC for a shallow wetland. While we continue to not fully agree with Jones & Stokes on the quality, interpretation, and extrapolation of some of the experimental results, overall, we do agree the efforts were worthwhile in examining water quality changes associated with creating a shallow wetland. It is important to note that these studies were not designed to simulate the proposed full scale water storage island operation. Therefore, it is uncertain as to how well these small scale experiments could predict final water quality conditions in a fully flooded island that will undergo a series of filling, holding, and draining sequences within an organic-rich basin of porous peat soil. B7-27

In summary, completion of the Delta Wetlands Project will determine if Jones & Stokes' modeled environmental impacts are accurate in predicting the degree of impact from the proposed discharges on water quality. We are unaware of similar water storage projects on peat islands that can serve as case studies. There are, however, many examples of constructed wetlands in the literature.

Flooded Wetland Experiment

The statement (pg. C3-7) that substantial leaching of the peat soil did not occur because some inorganic variables (EC, TDS, sodium, chloride, and bromide) typically increase during soil leaching in agricultural operations is correct only if there was significant salt accumulation in the fields prior to leaching. The condition of the test area on Holland Tract was not reported prior to constructing the wetland. The area may not have had any salt buildup. It may have been leached earlier, not irrigated, or salts may have been removed with the top soil if the wetland area was scraped to create the berms for the ponded area. Therefore, substantial leaching of peat soil cannot be completely ruled out on the sole basis of unobserved salt leaching. B7-28

Seasonal Storage Experiment

For the same reasons as stated above, the statement (pg. C3-8) that the constant levels of inorganic variables suggest that soil leaching with associated release of salts did not occur during the storage period is incorrect.

Further analysis of the data from the Jones & Stokes' experiments by DWR are contrary to the Jones & Stokes' conclusion (pg. C3-8) that very little, if any, additional release of materials from peat soil leaching will occur during the water storage period. The THM Yield (C-THM divided by TOC) of the Holland Tract wetlands B7-29

experiment, vegetation decay experiment, and peat soil extraction tests were compared. The results are shown in the following table:

THM Yield (ug/mg)

Experiment	Beginning	End
Flooded wetland (10 weeks)	13.5 (11/3/89)	8.2 (1/15/90)
Seasonal water storage (3 months)	5.2 (4/23/90) top 5.3 bottom	7.1 (7/25/90) top 6.2 bottom
Vegetation decay (10 weeks)	8.3;11.2 (2/27/92) 1X 7.8;7.5 2X	10;11 (4/29/92) 1X 8.6;9.1 2X

The THM yield for the peat soil extract 7-day holding time experiments ranged from 6 to 8 ug/mg for surface samples and 4 to 7 ug/mg for bottom samples.

The vegetation decay experiment THM yields were similar to the flooded wetland THM yields. The vegetative decay THM yields were increasing over time in the10-week experiment but decreasing in the flooded wetland. The THM yields indicate that vegetative decay was the initial major THM precursor source during the flooding of a wetland but peat soil leaching also contributed to lowering the THM yield of the water in the flooded wetland. B7-29 cont'd

During the seasonal water storage period, peat soil leaching appears to become the dominant source of THM yield as decaying vegetative matter is depleted and lost as carbon dioxide to the atmosphere. The bottom sample peat soil extract THM yields were similar to the seasonal storage THM yields. The THM yield data indicates peat soil leaching will occur during the water storage periods of the DW project. There is dissolution of peat soil organic matter and diffusion across the soil-water interface. Peat soil is extremely porous and diffusion processes cause the migration of high DOC pore water to the overlying lower DOC stored water to reach equilibrium. The high solubility of peat independent of saturation holding time was mentioned on page C3-16. The conclusions (pg. C3-20) about the contribution of DOC load in the wetland experiment should be corrected and reflect the above analysis and interpretation by DWR.

Jones & Stokes did not conduct water quality monitoring of the siphons and drains nor flow measurements of applied water to the four project islands to supplement their pumped drainage volume data to assess the No Project Alternative. For a study of this magnitude and with the opportunity to collect these data during the B7-30

last six years, it is inexcusable for Jones & Stokes to imply the Department as being responsible for collecting their needed data to obtain a direct estimate of DOC from agricultural drainage on Holland Tract or any other island (pg. C3-20). B7-30 cont'd

Comments on Appendix C5. Modeling Trihalomethane Concentrations at a Typical Water Treatment Plant Using Delta Export

The WTP model for national use underestimates the THMFP of source waters with high bromide concentrations such as Delta waters. Delta waters are in the 90th percentile range in bromide concentrations of U.S. drinking water sources. As stated in the DEIR/EIS, the Metropolitan Water District of Southern California had contracted with Malcolm-Pirnie to develop a new set of equations to compensate for high bromide concentrations in Delta waters (pg. C5-6).

According to MWDSC (Stuart Krasner, pers. comm. 10/95), the predicted relative changes are more important than the absolute THM concentrations results of the original model in assessing the impact of the DW project. Until Jones & Stokes compares the results of the old model to the new model, the validity of the assumption that recent model improvements are not expected to change the impact assessment results as shown in the appendix (pg. C5-6) has not been demonstrated. One of the conclusions stated that the WTP model tended to underpredict THM concentrations because of uncertain chlorine doses and an insensitivity to Br- concentrations and Br-THM formation (pg. C5-10). B7-31

The conclusion (pg. C5-10) that "the maximum annual average increase attributable to DW project operations was less than 0.2 mg/L of DOC and therefore less than 4 ug/L of THM, which is less than 4 percent of the MCL for drinking water" should include comparisons to the proposed year 1998 and 2002 MCLs. By year 1998, the predicted THM increase will be less than 5 percent of the 80 ug/L THM MCL. By year 2002, the increase will be about 10 percent of the 40 ug/L standard.

Division of Operations and Maintenance

Project Operations Planning Branch

The nature of flow, water quality, and biological problems in the Delta require vigilant monitoring and, most often, premeditated actions to continue conformity to standards. Such actions currently involve cooperative efforts between the CVP and SWP operation groups. No such coordination, plan, or procedure for addressing these problems with DW are discussed. Stated mitigation measures include monitoring (though not how) and operational adjustments to accommodate "...calculated EC contribution from DW operations." Seldom is any EC value attributable to a specific operation or flow value. Furthermore, many considerations of B7-32

the SWP operation accommodate agreements with North Delta Water Agency and South Delta users. These include North Delta EC values and South Delta stage levels. No such consideration is stated in the DW DEIR/EIS. Other requirements include those contained in the '95 WQCP such as minimum outflow (NDOI) and maximum percent of inflow diverted. The equations used to determine compliance with these parameters may have to be modified to accommodate the DW operations, yet no such measures are discussed. B7-32 cont'd

DW has potential to affect sensitive fish species in the Delta that may indirectly cause SWP impacts on those species to increase. For example, under the "zone of influence" theory, DW increases the potential for Sacramento River fish to stray into central/southern Delta where they may be impacted by SWP/CVP export pumping. Coordination of "adaptive management" due to real-time monitoring under the CALFED process may be difficult. B7-33

Although the EIR/EIS procedure may not demand a detailed operational procedural plan, review of such a plan is needed before DW impacts on SWP operations can be sufficiently determined. These arguments may be best suited for any water rights hearings for the DW. B7-34

Additional comments relating to specific pages within the DEIR/EIS follow.

Shouldn't future export pumping capacity include North Bay Aqueduct and Contra Costa Canal to define the limits in determining actual exports? p. 2-6 B7-35

Diversions to storage under Alt. 1 & 2 are somewhat optimistic, since flows are assumed to have an even distribution. p.2-6 B7-36

Discharges from storage under Alt. 1 & 2 assume that they can be utilized just because there is "wheeling" capacity in the SWP or CVP export capability. p. 2-6 B7-37

Selling seasonal wetlands water during the month of May would be difficult, since exports are severely restricted. pp. 2-8&9 B7-38

Wheeling of discharges from Alt. 1 & 2 during the months of April and May during dry years would not be feasible, since exports are limited. Table 2-2 shows an average of 12 TAF and 16 TAF for the two months which looks relatively small. But, upon examination of individual dry years (Table A3-7b) there are discharges for wheeling that exceed 1000 cfs and may be difficult to be exported. B7-39

During the period of mid-December through mid-March the SWP can exceed 6680 cfs when the San Joaquin River is greater than 1000 cfs. pp. 3-5 B7-40

To assume a continuous pumping rate of 10,300 cfs for an entire month is not realistic. Some allowances should be made for plant outages and reasonable flow distribution. pp. 3A-7 & 18 B7-41

If the wet years were eliminated from the discharges for export in Alternative #1, the average discharge for export would be reduced about 80 TAF annually. pp. 3A-14 B7-42

Annual water sales are quoted as $44-$55 million annually. This is based on $200-$250 per acre-foot and a water yield of 222 TAF per year. Shouldn't the annual sales be based on the discharge from storage (188 TAF) which is water actually sold or exported. Annual water sales would then only be $38-$47 million. Buyers would not be paying for evaporation and other losses. pp. 3K-10 B7-43

Instream releases for fish & wildlife are made for both Oroville and Shasta Reservoirs. p. A1-3 B7-44

The SWP 8500 cfs export limit used in DWRSIM allows for uneven flow distribution and outages that could occur at Banks Pumping Plant. p. A2-8 B7-45

Apparently the DeltaSOS does not simulate the Delta the same as DWRSIM in all cases. In some instances additional water is required at Sacramento to satisfy Delta requirements for CU, outflow and export. No estimate is given as to the magnitude (relatively small?) of this "imaginary water" or where it would come from. p. A2-10 B7-46

Why wasn't North Bay Aqueduct included in the simulated SWP and CVP exports? p. A3-3 B7-47

Table A3-4a (Initial DWRSIM exports) + Table A3-4b (DeltaSOS Adjustments) should equal Table A3-4c (DeltaSOS Exports). On a monthly-cfs basis they do, but the annual totals (TAF) do not add up. The total in table A3-4 seems to be in error. B7-48

Environmental Assessment Branch

We generally concur with the adverse effects identified in the draft EIR/EIS on water quality from project discharges. However, we have several concerns associated with the proposed reservoirs which need to be addressed with specific management objectives.

The first relates to the mitigation measures for reducing impacts to less-than-significant through "*adjustment of DW project discharge based on measurement ... during intended discharge periods and monitoring in channel receiving waters.*" We concur with the measure that "*mitigation monitoring to compare DW project discharge water quality with channel water quality should be required*", but it is unclear what B7-49

specific activities would link measurement of discharges with reduction of impacts. How would impacts be reduced if given high DOC readings in the stored water repeatedly exceed the "*selected significance criterion of allowable change in export DOC*" (section 3C-28)? It is not specified how these discharges would be regulated. B7-49 cont'd

Our second concern is regarding the potential impacts caused by rapid growth and die-off algal populations needs to be better addressed. They include:

- Oxygen depletion from increased BOD associated with algal decomposition; B7-50
- Taste and odor products, especially geosmin and 2-methylisoborneol (MIB) increases;
- pH increase;
- Algal control additions, i.e., copper sulfate, etc.

DIVISION OF PLANNING

Review of Delta Wetlands EIR Impact Analysis Modeling

DeltaSOS versus DWRSIM

It is difficult to discern the rationale for the J&S approach to impact modeling. The base condition delta inflow hydrology is provided by DWRSIM studies under 1995 WQCP constraints. DeltaSOS is then used to model operation of the DW project without the ability to account for upstream and downstream reservoir storage and aqueduct capacity (A1-2). The advantage of DeltaSOS appears to be the inclusion of mechanisms for soil moisture, ET, rainfall, applied irrigation, and leach water accounting. This relatively simple capability is necessary. However, the inability of DeltaSOS to simulate reservoir operations would appear to be a much larger disadvantage. It is not clear why J&S did not adopt the public domain DWRSIM program and modify it to handle monthly island water budgets. This would have provided a consistent and more sophisticated tool for identifying incremental impact of the DW project. B7-51

DailySOS limitations

J&S acknowledges the monthly time-step limitation of DeltaSOS and provides daily impact analysis (DailySOS) to give an indication of the differences. However, without a compelling explanation, the DeltaSOS continues to be used for the main impact analysis. It appears that the DailySOS might have been used to greater advantage considering that the goal of the DW project is to capture the peak of flood flows which are low frequency, short duration events. B7-52

No DW Releases to Go To Outflow

The DW project does not include a direct hydraulic connection to the State or federal pumping plants. Despite this, releases from DW for export are assumed to flow in total to the south delta project pumps (Tables A3-9, 12) This is not likely to be a reasonable assumption and should be investigated with hydrodynamics models. Extensive hydrodynamics modeling was conducted. However, no mention is made about the impacts of DW discharges on Delta outflow. B7-53

Take Limits

There is discussion (A4-10, 11) about take limits for endangered fish species and the current difficulty of modeling the limits. Despite the discussion, operations and impacts of the DW project are simulated using DeltaSOS without any consideration of the probable reductions to project capacity due to take limits. B7-54

X2 Equation

There appears to be no basis for solving the Kimmerer-Monismith monthly X2 equation for the "steady-state X2," after which an artificial adjustment is applied to correct X2 for last month's X2. It is not clear why the Original Kimmerer-Monismith monthly equation is not used directly. B7-55

Hydrodynamic Simulation Model Verification

There is no mention of the calibration/verification of the model against flow data. Therefore, it is not possible to know how the model is performing in calculating flow and velocity in the channels. This is the most important factor in driving the advection part of the salinity model. B7-56

There is no flow split verification of the model at some key locations. This is a very important factor in driving the salinity model.

SWP Pumping Capacity and Pumping Rate (P. 8 of Executive Summary)

The description for "physical export pumping capacity" is misleading and incorrect for the SWP. A statement should be added to explain that Clifton Court Forebay and its intake gates limit the maximum average export capacity to an estimated 8,500 cfs. This value should be used as the maximum average monthly export capacity. With current SWP facilities, exports through Banks Pumping Plant can only reach 10,300 cfs for short periods of time during periods of high Delta inflows. B7-57

The description for "permitted pumping rate" is incorrectly stated. The Corps requires a permit for current SWP export pumping at Banks Pumping Plant. This is the existing Permit No. 5820A, which limits the maximum 3-day average pumping rate to 6,680 cfs. This current permit also allows increased pumping at SWP Banks Pumping Plant between December 15 and March 15, as a function of the San Joaquin River flow at Vernalis. During this three-month window the maximum SWP pumping rate can go as high as 10,300 cfs for short periods of time, but the maximum average monthly rate is estimated to be 8,500 cfs. Thus when these maximum SWP export rates are combined with the CVP Tracy Pumping Plant capacity of 4,600 cfs, the combined maximum winter month export limit could reach 13,100 cfs (CVP + SWP). In general all SWP export pumping (current or with proposed facilities) is regulated by Corps permits. Additionally, the ability to fully increase SWP exports to 10,300 cfs with proposed South Delta Improvements will also require a new or modified permit from the Corps. B7-57 cont'd

Cumulative Impacts Analysis

Page A3-13, left side - 4th paragraph.

For the Cumulative Impact studies, this paragraph states that assumptions were the same as for the individual alternatives analyzed, except that SWP Banks pumping capacity was increased to the full 10,300 cfs. This implies that SWP export pumping and deliveries to SWP contractors were maintained at the present 1995 level amounts (2.6 to 3.6 MAF/year) as reported on page A3-2. For cumulative impact analysis a better approach would be to use the projected future level of SWP Contractor request, which total 4.1 MAF/year with no reductions due to large local supplies in wetter years. DWRSIM model studies that have been simulated with these higher demands produce significantly different Delta inflows, exports and outflows; which in turn could alter the proposed operation of the DW project. B7-58

Clifton Court Gate Operations

Under the section on "Daily CVP And SWP Operations" (pages A4-7 to A4-9) a paragraph should be added regarding the operation of the Intake Gates to Clifton Court Forebay. Under balanced conditions in the Delta, these gates are opened and closed twice daily on the tidal cycles, and thus control the amount and quality of water that moves to the SWP Banks Pumping Plant. The DW EIR text should describe how the water released from the DW islands will be moved through the Intake Gates, in relation to the tidal cycles and required opening and closing of the gates. B7-59

DeltaSOS model

As indicated on pages A3-3 and A3-5, the DeltaSOS model studies appear to have set all values for X2 outflow, carriage water, Delta inflows, SWP Banks and CVP B7-60

Tracy exports, and the WQCP inflow/export ratio criteria using the data resulting from DWRSIM Study 1995c6b-SWRCB-409. These items remain fixed for the model studies of the DW Project alternatives. A more realistic approach should be considered, whereby the effects of diversions and discharges to and from the DW islands on the above items is dynamically evaluated. DWRSIM model study experience has indicated that changes in Delta diversions and exports can at times result in different carriage water requirements, X2 requirements, Delta inflow, and also different amounts for the inflow/export ratio limits. B7-60 cont'd

DIVISION OF SAFETY OF DAMS

We have reviewed the DEIR for the Delta Wetlands Project dated September 1995. The DEIR indicates requirements of the Division of Safety of Dams may limit storage capacities and may result in a final storage elevation of less than +6 feet relative to mean sea level. The DEIR does not distinguish if this is the jurisdictional limit of this Division. However, Part 1, Division 3, Section 6004, of the California Water Code indicates that levees in the Sacramento-San Joaquin Delta shall not be considered a dam if the maximum possible water storage elevation of the impounded water does not exceed <u>four feet</u> (+4) above mean sea level. B7-61

If the projects involve jurisdictional dams, a construction application will be required. All dam safety issues related to the proposed work would have to be resolved prior to approval of the application and any construction activity.

ENVIRONMENTAL SERVICES OFFICE

<u>Hydrodynamics</u>

3B-8 col 1 para 2 For many analyses, a 19-year mean tide is sufficient. However, for many biological issues, the extreme conditions and their frequency which are lost in the averaging process are the most significant in terms of impacts. B7-62

<u>Comments on Chapter 3F-Fish Resources</u>

More Information Should be Provided About the Proposed Adaptive Management Strategy for Fisheries: Real-time monitoring in conjunction with fish transport modeling is suggested as a primary adaptive mitigation measure for fisheries (3F-25 through 3F-27). The report does not adequately address the following issues: B7-63

- Who will collect the required data?

  The text indicates that adaptive measures will rely on data on the distribution and abundance of a variety of species and life stages. The only data source clearly

identified are SWP and CVP salvage facilities. The project should specify where and how the additional data will be obtained.

- Can the data be processed quickly enough to allow adaptive management?

  The 1995 Interagency Ecological Program "real-time" monitoring program showed that it may be possible to collect and process data within one to two days. However, the effectiveness of this strategy to reduce impacts for multiple species under different water year types remains unproven. Note that "real-time" operations data would also be required for this effort.

- Can transport modeling be performed quickly enough to allow adaptive management?

  Even if all of the necessary data can be collected, it is unclear whether the fisheries and operations data can be rapidly processed and formatted to run transport models. Additional time must be allowed for interpretation of model results and decision- making by managers.

- Is transport modeling useful for all of the species of interest?

  Transport modeling remains an untested tool to reduce impacts in the Estuary. The ability of transport modeling to predict the movements of strong swimmers such as outmigrating salmon smolts is particularly questionable.

B7-63 cont'd

A Potentially Major Project Impact was Not Addressed: Fish screens may indeed significantly reduce entrainment losses. However, the construction of fish screens and other project features such as docks and outlet siphons is likely to attract predators, creating feeding stations that increase the losses of resident and migrating species. This concern is greatest near intakes, where prey would become concentrated in the channels as water is removed from screened diversions and "reverse flows" continue to pull more prey into the area. This effect could create a highly efficient feeding station for predators. Impacts are likely to be greater for species such as splittail and delta smelt which frequently rear in the Delta to adulthood. These concerns were not addressed in the report.

B7-64

More Details are Needed about Mitigation of Fisheries Through Habitat Creation: The focus of the mitigation program for this project is the creation of migrating waterfowl habitat. However, some of the most significant impacts are to fisheries. Although the report states that the project will use avoidance to the extent possible, there will be some unavoidable impacts during construction and project operation. The text states that habitat replacement would be used at a ratio of 3:1 (3F-15, Col. 2, Para 2-3). However, the report also notes that specific habitat parameters have not yet been defined for delta smelt and splittail, two of the species of greatest

B7-65

concern (3F-15, Col. 1, Para 4). Unless habitat for these species can be identified, it is unclear how habitat replacement would be conducted. Additional details are needed about how habitat impacts will be identified and mitigation will be established.

Although it may not be possible to locate the specific habitat areas, it appears that vegetated, shallow water habitat is important for delta smelt and splittail. Possible methods to create this type of habitat include:

B7-65 cont'd

1. Create additional fisheries-accessible shallow water areas outside the project area.

2. Construct internal levee walls within a habitat island, then breach a portion of the outside levee walls. This would create tidally-influenced habitat on the island. Portions would be graded where possible to create shallow water habitat.

Fisheries Life History: Chapter 3F and Appendix F1 provide a good, balanced overview of the biology of several fish species including striped bass and American shad. However, the sections on delta smelt and splittail need to be updated based on new findings about these species. The most substantial changes are required in the splittail section--specific comments are provided in a following section of this review. B7-66

Fisheries Impact Modeling: A number of the methodologies used to evaluate fisheries impacts appear to be innovative and deserve greater detail. Insufficient information is provided in Appendix F-2 for several key analytical techniques. Examples include modeling of the effects of operations on winter-run migration timing and modeling how agricultural and habitat island diversions affect winter-run survival. B7-67

The Analysis of Estuarine Habitat for Delta Smelt and Striped Bass is Questionable: A key impact analysis method in the EIR/EIS is the calculation of estuarine habitat area indices for different alternatives. However, the optimal salinity range for delta smelt and striped bass was apparently calculated from egg and larval survey results. This is survey primarily catches very early life stages (<20 mm) which probably have little ability to actively select salinity ranges. A more appropriate approach would have been to use townet or midwater trawl results, which catch larger fish. B7-68

Algal Blooms: The possibility of algal blooms on the project islands is mentioned relatively briefly (3F-16, Col. 1, Para. 6) with respect to dissolved oxygen. However, algal blooms have a broader range of impacts. Among the possible benefits, the food chain may be enhanced if blooms of the appropriate species of algae and associated zooplankton grazers are released into the Delta. This effect is listed as beneficial (Appendix F-2, Page 5-17). Alternatively, nuisance blooms of B7-69

algae (eg Melosira) can potentially reduce the feeding efficiency of zooplankton, clog screens, and create taste and odor problems. We recommend that an algal bloom management plan be prepared to deal with this contingency. B7-69 cont'd

Fish Screen Issues: Fish screen design criteria and guidelines are applicable to the proposed diversions through the Department of Fish and Game and the National Marine Fisheries Service (Southwest Division). Although these criteria address primarily the needs of anadromous fish, they are in general applicable to the screening needs at this site. The U. S. Fish and Wildlife Service has addressed interim criteria for delta smelt in terms of approach velocity needs that differ from the general criteria of DFG and NMFS. Consultation with the USFWS on these issues should be addressed during the fish screen design review. Although much of the applicable criteria for screening is seemingly mandated, it is the underlying objective of fish protection that really must be applied to the intake design. With this in mind, a screen facility can be designed that may not meet all criteria, but still be considered acceptable to the fishery agencies. Intake screens should take into account the best available technology and be protective of a variety of fish species and lifestages in addition to those of threatened or endangered status. The present screen design will offer limited protection to larval sized fish for instance, but a fishery agency may determine protection for that lifestage is necessary. With all alternatives, operation of any fish screening facility is integral to the given design

The fish screen intake design presented is general in nature, but sufficient in detail to comment on. Based upon our interpretation of the existing criteria objectives, the design will require substantial modifications to meet fishery needs and suit practical needs and considerations. The four intake facilities would combine to make one of the largest full physical exclusion screens in the world. Screen systems of this magnitude require additional considerations due to the concentration of potential fishery activity at one location. Consideration should include predator control features, hydraulic control, debris and cleaning systems, maintenance, fish passage measures (such as a bypass and collection system to remove fish from the area by some means), and additional operational procedures. B7-70

A large series of individual screen units, that may be adequate if installed at a site on their own, may not be suitable when concentrated together. The present configuration simply lacks the necessary hydraulic conditions during diversions that are necessary for this type of system. Existing fish screen criteria requires sweeping flows (and velocities) by a screen to reduce fish exposures and to pass them (and debris) away from the diversion. During peak diversion, flows will be drawn from the surrounding channels and directed predominately into the diversion screens. These conditions occur during peak high slack water periods and could last for several hours. Fish may be drawn progressively into this "dead end" area, creating a high concentration of juvenile and larval fishes that may be drifting in response to the flow. Increased predator opportunities may result which must be considered into the

overall efficiency of the facility. At the SWP's J. E. Skinner Fish Protective Facility, for instance, it has been determined that predation is one of the most significant losses at the facility. Predatory fish may be able to take advantage of the DW intake facility's structures and hydraulic flow inconsistencies and prey on the concentrations of smaller fishes in the area. Smaller fish may be trapped and concentrated in this area due to the lack of bypass past the screens.

Debris concentrations may also pose some problems with the present design. A cumulative effect could occur during periods of maximum diversion due to poor sweeping flows through the area. Maintaining screens is important to efficient diversion operations (reduces head losses) and in reductions in fish injury. Debris accumulations can also result in non-uniform flows through the screens which may exceed the given velocity criteria. If sweeping flows through the area are insufficient, or it is not continuously removed, this requirement may not be met. Debris removal in this situation may require skimmers, vertical rakes, or other means to physically remove the debris out of the water. DFG requires screens to be capable of being "continuously" cleaned at up to five minute intervals. It further stipulates that unless this requirement is met, screen area should be increased four fold. Automated cleaning systems, such as hydraulic backwash or brushing systems should be considered to supplement the method proposed of lifting the screens out of the water. **B7-70 cont'd**

From a maintenance point of view, it is desirable to have the intakes consolidated at two sites per island, however due to the concern raised, alternative intake designs which include some type of fish collection facility may be appropriate. Alternatives to explore include lowering the screen approach velocity so prolonged exposure and fish impingement is alleviated or to reduce the localized screen exposure area by spreading the screens around the island.

Page 3F-5, Column 2, Para 1. Contrary to the assertion that net reverse flows transport striped bass eggs and larvae to the SWP and CVP facilities, particle tracking studies show that QWEST is a poor indicator of entrainment risk (DWR/USBR 1994). One reason for this observation is that tidal flows in this region are dramatically higher than QWEST and probably have an overriding impact. **B7-71**

Page 3F-6, Column 1, Para 4. The statement that larval smelt are carried downstream to a location near the entrapment zone (2 ppt) needs to be clarified. It appears that the abundance of delta smelt peaks upstream of the entrapment zone at approximately 0.5 ppt (DWR/USBR 1994). However, the distribution of delta smelt is often broad and large numbers occur upstream and downstream of this point in all water year types. They frequently maintain a broad distribution through adulthood. The text needs to point out that delta smelt are not necessarily concentrated in one narrow salinity band. **B7-72**

Page 3F-6, Column 2, Para. 2. The comment that entrainment risks for smelt are lower in Suisun Bay is accurate. But this does not necessarily mean that Suisun Bay has "improved habitat conditions". We are not aware of any documentation showing that smelt prefer this particular region, only that they prefer a range of salinities which may occur in many geographical locations. Indeed, neither the smelt midwater trawl or townet index are correlated with the proportion of the population located in Suisun Bay. Moreover, the townet survey results show that, on the average, the Delta contains the highest proportion of the smelt population. The possible habitat value of the Delta should therefore not be underestimated. B7-73

Page 3F-7, Column 1, Para 3. The distribution of splittail presented is incorrect. Again, the authors should review DWR (1995). Also, recent Interagency Ecological Program sampling shows that substantial numbers of splittail are present far upstream of the Delta in both the Sacramento and San Joaquin systems in all months of the year. They are clearly not largely confined to the estuary. B7-74

Page 3F-16, Col. 2, Para. 4. It is correct that "most juvenile salmon do not migrate along the Old and Middle River pathway", but this route remains a corridor for San Joaquin salmon. Increased water temperatures from DW operations may pose additional risks to this increasingly rare race of salmon, particularly at localized discharge points. B7-75

Page 3F-23, Column 3, Para. 3. The text states that splittail would be efficiently screened by DW diversions. What is the basis for this statement? We are not aware of any species-specific screen criteria for splittail. This is an important issue as exceptionally large numbers of juvenile splittail were observed in the San Joaquin system in 1995--new diversions in this area such as DW could pose an important new risk. B7-76

Page 3F-25, Column 1, Para. 2. Real-time monitoring in conjunction with fish transport modeling is suggested as an adaptive mitigation measure to reduce entrainment of San Joaquin and Mokelumne salmon. It is highly questionable that fish transport modeling will be a useful tool to predict entrainment risks for outmigrating salmon. They are strong, very active swimmers, not "particles". Moreover, smolts often move relatively fast through the system--it is doubtful that data obtained from such a monitoring exercise could be processed and input into a transport model in sufficient time to respond. B7-77

Page 3F-26, Column 1, Para. 2 and 5, and Page 3F-27, Columns 1-2. Adaptive management based on field measurements and transport modeling is suggested as a means to reduce entrainment of striped bass, delta smelt and longfin smelt larvae. It is unclear where the data necessary to achieve this would come from or the time scales required. The Interagency Ecological "real-time" monitoring program in 1995 is B7-78

perhaps the sort of data that would be useful for such an effort, but there is no guarantee that this type of monitoring will occur each year in the future. The feasibility of such an adaptive management strategy remains unproven–it is still questionable whether "real-time"data can be collected, processed, then input into a transport modeling studies fast enough to provide an acceptable response time. B7-78 cont'd

Page 4-10, Column 1, Para. 2. It appears that the abundance of delta smelt peaks upstream of the entrapment zone at approximately 0.5 ppt (DWR/USBR 1994). However, the distribution of delta smelt is broad and large numbers occur upstream and downstream of this point in all water year types. Also, the statement that smelt have been absent from Suisun Bay since the recent 6-year drought is incorrect. Smelt were consistently caught in this region in the two wet years (1993 and 1995) following the drought. B7-79

Page 4-14, Column 1, Para. 2. The conclusion that the midwater trawl is the most accurate index of splittail abundance is questionable. Through 1992, less than 500 individuals were caught in the history of the survey. Also, the survey does not sample most of the important upstream habitat. The authors should read DWR/USBR (1994) for a review of the strengths and limitations of each of the major surveys. B7-80

Page 4-15, Column 1, Para. 4. The salvage data are contrary to the conclusion that longer residence time in the Delta increases entrainment loss of juveniles. Residence time is greatest in dry years, yet salvage levels (total number and salvage/AF) are lowest during these periods (DWR/USBR 1994). B7-81

Page 5-11, Column 2, Para. 2. The Variable Migration Timing analysis is very confusing. We are not familiar with this type of analysis or how the results should be interpreted. For example, it is unclear whether the simulated winter run migration rate for February (12-53 percent) is positive, negative or neutral. More details need to be provided about this analysis--Appendix A is not an adequate description.

Page 5-11, Column 2, Para. 4 through Page 5-12, Column 1, Para. 3. The analysis of how agricultural and habitat island diversions affect winter run mortality indices is also poorly explained. Based on the description in Appendix A, the mortality index is affected by two operations factors: SWP + CVP exports and cross-Delta flow. It is unclear how agricultural and reservoir island diversions were integrated into this analysis. B7-82

Page 5-14, Column 2, Para. 1. The assumption that the DW facilities are unlikely to be located in preferred spawning or rearing habitat of Sacramento splittail needs to be reevaluated. Fisheries monitoring in 1995 showed that the San Joaquin system may used extensively for spawning and rearing. B7-83

California Department of Water Resources

B7-1. The Delta Wetlands Project would not be operated in a way that affects DWR water rights or SWP operation. The DeltaSOS simulations of Delta Wetlands Project operations for the 1995 DEIR/EIS and 2000 REIR/EIS were based on DWRSIM results, which incorporate operations of the SWP. DeltaSOS determines when there is surplus water available only after maximum possible SWP and CVP exports are simulated to have been satisfied. As described in Chapter 2 of the 1995 DEIR/EIS under "Coordination with Water Rights, Delta Standards, and Fish Take Limits"(page 2-18 of FEIS Volume 1), permits granted by the SWRCB would require that project diversions not interfere with the diversion and use of water by other users with riparian or prior (senior) appropriative rights. When DWR's Division of Operations and Maintenance and USBR's Central Valley Operations Coordinating Office (CVOCO) designate the Delta condition to be in balance, all Delta inflow is determined to be required to meet Delta objectives and satisfy diversions by senior water right holders and Delta riparian users. Therefore, when the Delta is in balance, additional water would not be available for diversion by the Delta Wetlands Project. When DWR and CVOCO determine that the Delta condition is in excess, the Delta Wetlands Project could be allowed to divert available excess water for storage on the reservoir islands. The daily quantity of available excess water would be estimated by DWR and CVOCO according to their normal accounting procedures.

Since this comment was provided, DWR and Delta Wetlands have entered into a stipulated agreement affirming the seniority of DWR's water rights; USBR and Delta Wetlands also entered into a similar agreement. These agreements are described briefly in Chapter 2 under "Stipulated Agreements" (see page 2-21 of FEIS Volume 1) and summarized in Appendix A of the 2000 REIR/EIS. The timing and quantity of surplus water would be a joint determination of SWP and CVP operations staff. The FOC include a diversions measure to limit the fraction of the surplus water that can be diverted by Delta Wetlands to 90% in August through January, 75% in February and July, and 50% in March and June.

There may be some potential Delta conditions where previous Delta Wetlands operations would change the Delta outflow or X2 position sufficiently to indirectly influence SWP or CVP operations. However, the several specific limits placed on Delta Wetlands operations in the FOC and in these general stipulated agreements reduce the likelihood of these potential indirect effects. With daily accounting of Delta Wetlands operations and other Delta conditions, it should be possible to isolate any such effects and prevent Delta Wetlands from interfering with SWP or CVP operations.

B7-2. See response to Comment B7-1 regarding Delta Wetlands Project operations and senior water right holders. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for information on the protections provided to aquatic species and habitat by the federal and state biological opinions, which were issued after the date of this letter.

B7-3. The 1995 DEIR/EIS describes the Interim South Delta Program in Appendix 2 under "Related Agreements, Programs, and Studies" (see page 2-9 of Appendix 2), which provides a context for analyzing the cumulative effects of the Delta Wetlands Project. The cumulative impact analysis presented in the 1995 DEIR/EIS assumed that the Delta Wetlands Project would not interfere with water operations under the Interim South Delta Program. The Delta Wetlands Project would only divert water available beyond that required by the SWP and the CVP, including the increased SWP pumping capacity proposed under the South Delta Program.

To assess cumulative impacts, DeltaSOS simulations were performed for operations that would be consistent with the 1995 WQCP, but allowing for SWP export pumping at the full physical capacity of 10,300 cfs for Banks Pumping Plant as proposed under the Interim South Delta Program. Based on these simulations, the Delta Wetlands Project would operate in fewer years under cumulative conditions than under existing conditions because of limited availability of water for diversions in some years. Because of greater export pumping capacity, however, greater Delta Wetlands exports were simulated in several years. The Delta Wetlands Project would comply with all applicable Delta standards and operating criteria that were assumed under cumulative conditions as these occur with future development of Delta facilities. The 2000 REIR/EIS assessments were based on these same assumptions.

Additionally, the Interim South Delta Program would control water levels and flow in south-Delta channels to maintain higher low-tide levels. Because the Delta Wetlands Project diversions would occur during high-flow periods, water levels in the south Delta during low tides would not be affected substantially by Delta Wetlands Project diversions.

B7-4. The commenter is referring to information in the 1995 DEIR/EIS that was augmented by the 2000 REIR/EIS. Chapter 4 of the 2000 REIR/EIS (see Chapter 3C of FEIS Volume 1) and Appendix G of the 2000 REIR/EIS presented a new analysis of DOC loading from peat soils and resulting THM levels in the context of revised EPA standards for DBPs. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

B7-5. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

B7-6. Delta Wetlands' levee designs would need to be approved by the DSOD if the levees were intended to impound water to a level above 4 feet mean sea level. Part 1, Division 3, Section 6004 of the California Water Code states that "the levee of an island adjacent to tidal waters in the Sacramento–San Joaquin Delta, as defined in Section 12220, even when used to impound water, shall not be considered a reservoir if the maximum possible water storage elevation of the impounded water does not exceed four feet above mean sea level, as established by the U.S. Geological Survey 1929 Datum". If Delta Wetlands' final design for its levees met California Water Code criteria for dams, the levees would fall

under DSOD jurisdiction and would be subject to DSOD design review and permit approval.

B7-7. The commenter is referring to information in the 1995 DEIR/EIS that was augmented by the 2000 REIR/EIS. Chapter 4 of the 2000 REIR/EIS (see Chapter 3C in Volume 1 of this FEIS) and Appendix G of the 2000 REIR/EIS present a new analysis of DOC loading from peat soils and resulting THM levels in the context of revised EPA standards for DBPs. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project Effects on Disinfection Byproducts".

B7-8. The relationships between water quality parameters analyzed in the 1995 DEIR/EIS are fully discussed in Appendices C1, C2, and C3. DOC is assumed to behave as a conservative variable during storage in agricultural soil water and on Delta Wetlands' reservoir islands. As described in Appendix C2 under "Delta Agricultural Dissolved Organic Carbon Budget" on pages C2-5 and C2-6, measured electrical conductivity (EC) was used with the DOC:EC ratio for applied irrigation water to estimate the DOC concentration of applied water and the DOC concentration of drainage water that would be expected without additional sources of DOC. The difference between this estimate and the observed DOC concentration of drainage water was then calculated. The result provides an estimate of the fraction of the drainage DOC originating from various sources. Use of this method is necessary because direct measurements of applied-water DOC and drainage flows are not available. This method is described in the 2000 REIR/EIS also, beginning on page G-2 of Appendix G.

B7-9. The results of the Holland Tract wetland experiments are described on pages C3-7 and C3-8 and conclusions are described on page C3-8 in Appendix C3. The determination that peat soil leaching contributed minor amounts of TOC to the water in the flooded wetlands was based on the rate at which TOC loading was observed to take place, as well as on the lack of change in concentrations of inorganic variables. The TOC loading resulted from two sources: immediate decay of surface material (vegetation) and ongoing (continued) peat soil leaching. The experiments showed a major contribution of TOC in the first week and only a small ongoing contribution, indicating that vegetation decay was the major contributor of TOC.

The DOC-loading estimates used in the 1995 DEIR/EIS were augmented with information from experimental measurements of DOC loading that were made by DWR after the 1995 DEIR/EIS analysis was completed. Chapter 4 of the 2000 REIR/EIS (see Chapter 3C of FEIS Volume 1) reported the results of the DWR Special Multipurpose Applied Research Technology Station (SMARTS) experiments, which were designed to observe and quantify relationships between the peat soil and DOC concentrations in standing water overlying the peat soil. The results provided a range of assumptions about DOC loading that were used in the impact analysis. The section "California Department of Water Resources Special Multipurpose Applied Research Technology Station Studies" in Chapter 4 of the 2000 REIR/EIS (see page 3C-55 of Chapter 3C of FEIS Volume 1) describes the measurements and application to the evaluation of Delta Wetlands Project effects.

B7-10. The comment refers to the discussion of Mitigation Measure C-5, which requires measuring DOC concentrations in water stored on the project islands and in Delta channels and, when necessary, restricting discharges to control project effects on DOC levels in exports. The WQMP negotiated by Delta Wetlands and CUWA requires similar monitoring. Using field automated TOC analyzers may be an excellent way to obtain daily DOC measurements. Mitigation Measure C-5 has been revised to include this suggestion. On page 3C-32 of Chapter 3C of FEIS Volume 1, the last paragraph of Mitigation Measure C-5 has been changed as follows:

> The DOC measurements should be obtained using the best available monitoring equipment (which may now include field automated TOC analyzers) or could be obtained through conversion of field measurements of UVA using known relationships with DOC concentrations (Appendix C1, "Analysis of Delta Inflow and Export Water Quality Data", and Appendix C2, "Analysis of Delta Agricultural Drainage Water Quality Data").

On page 3C-33 of FEIS Volume 1, the first sentence of the first full paragraph is revised as follows:

> The DOC measurements should be obtained using the best available monitoring equipment (which may now include field automated TOC analyzers) or could be obtained from the relationship between field measurements of UVA and DOC concentrations (see Appendix C1, "Analysis of Delta Inflow and Export Water Quality Data").

B7-11. The 1995 DEIR/EIS analysis consistently employed a combination of field measurements and assumed relationships in modeling; assumptions were formulated only when data were unavailable. The impact assessment methodology recognized that both field data and modeling have uncertainty (much of the field data have 10% uncertainty). The recommendation for ongoing monitoring of water quality variables proposed in Mitigation Measures C-1 through C-7 was based on the assumption that actual values need to be observed so that Delta Wetlands Project effects on water quality variables during actual project operations can be determined.

B7-12. The statement on page 2-1 of the 1995 DEIR/EIS (page 2-1 of FEIS Volume 1) referred to by the commenter is part of the project purpose as defined by the applicant.

The water quality impact assessment was designed to evaluate changes in the quality of water that would result from Delta Wetlands Project operations. Significant water quality effects could temporarily result from project operations; the mitigation measures recommended in the NEPA and CEQA impact analysis were designed to address these effects. The ongoing monitoring recommended in Mitigation Measures C-1 through C-7 (similar to National Pollutant Discharge Elimination System [NPDES] discharge monitoring) would determine the levels of water quality variables; limiting Delta Wetlands discharges when measurements show the levels to be unacceptable would ensure that

project discharges would not significantly affect export water quality. In addition, the WQMP negotiated by Delta Wetlands and CUWA calls for similar monitoring and adjustment of operations to prevent significant water quality impacts and ensure the quality of water discharged by Delta Wetlands.

B7-13. It is unclear whether the commenter is referring to compensation for DOC and THM impacts resulting from habitat island discharges or resulting from project discharges in general.

Under the proposed project, Delta Wetlands would divert water onto the habitat islands to provide the water necessary for implementing the HMP. Diversions and discharges of water to and from the habitat islands would not differ substantially from existing agricultural practices. Because a large portion of the habitat islands would remain in agricultural crops, it is assumed that the DOC concentrations of habitat island discharges would be similar to those of current agricultural drainage. Discharge from the habitat islands would account for a very small proportion of water exported from the Delta; therefore, if DOC loading on the habitat islands were found to be greater than under existing agricultural practices, the resulting effect on export DOC concentration would be extremely small.

Implementation of the mitigation measures presented in Chapter 3C would prevent significant water quality effects resulting from Delta Wetlands Project operations. See response to Comment B7-12 for more information.

B7-14. The commenter is referring to a statement about 10% uncertainty in modeled values on page 3C-21 of the 1995 DEIR/EIS (page 3C-23 of FEIS Volume 1, Chapter 3C) under "Measures of Potential Water Quality Impacts and Criteria for Determining Impact Significance". The statement is part of the explanation for the significance criteria used in the water quality impact analysis; it was not intended as a statement of the degree of accuracy or precision of the modeled results. The text explains that because measurements and the model uncertainty error are *at least* 10%, a 10% change was allowed before an impact would be considered significant. The model assumptions and level of uncertainty are appropriate given current measurements and understanding of Delta conditions. See also response to Comment B7-11.

B7-15. The commenter is referring to information in the 1995 DEIR/EIS that was augmented by the 2000 REIR/EIS. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

B7-16. Formation of haloacetic acids is a function of the bromide and DOC concentration but is strongly dependent on the treatment process employed. Also, there is no available model for estimating the formation of haloacetic acids. The 1995 DEIR/EIS and 2000 REIR/EIS analyses therefore focused on changes in bromide and DOC concentrations as the most important indicators of potential project effects on supplies of treated drinking water.

B7-17. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

B7-18. New standards for THMs were discussed in Chapter 4 of the 2000 REIR/EIS under "Changes in Disinfection Byproduct Rules" (see page 3C-64 in Chapter 3C of FEIS Volume 1). See also CUWA's comments on the 2000 REIR/EIS (Comment R4-7) regarding likely revisions to the Stage 2 THM standard. New standards for THM, haloacetic acids, and TOC would require treatment plants that supply water to municipal users to modify treatment (e.g., eliminate prechlorination), which will reduce THM concentrations. As indicated in Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", the analysis of project impacts considered Delta Wetlands' proportional contribution to THM and other DBPs. More-stringent future standards would lower the baseline, but the relative contribution of Delta Wetlands Project operations to THM precursors would remain the same.

B7-19. Use of field automated TOC analyzers may be an excellent way to obtain the daily DOC measurements recommended in the mitigation measure. See response to Comment B7-10.

B7-20. Bromide and DOC concentrations remain the proper variables for regulating Delta Wetlands Project operations regardless of THM standards, which may change. The 1995 DEIR/EIS and 2000 REIR/EIS analyses therefore focus on changes in bromide and DOC concentrations as the most important indicators of potential project effects on supplies of treated drinking water. The significance threshold for THM was updated in the water quality impact assessment in the 2000 REIR/EIS. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

B7-21. Single monthly measurements were used to summarize the available data for convenience of analysis and simplification of presentation. No statistics other than averages were computed. The variability of sample values was not directly evaluated for these data.

B7-22. DOC was assumed to be conservative for purposes of impact assessment. The assumption that DOC in soils behaves as a conservative parameter allows for an estimate of the additional source of DOC. As described in response to Comment B7-8, measured EC was used with the DOC:EC ratio for applied irrigation water to estimate the DOC concentration that would be expected if DOC is conservative without additional sources of DOC. The difference between this estimate and the observed DOC concentration was then used to estimate the fraction of the drainage DOC originating from various sources of DOC.

B7-23. There are no measurements of a complete Delta island DOC mass budget. It is therefore necessary to use indirect methods to estimate DOC loading. See response to Comment B7-8.

B7-24. Figure C2-1 does have a DOC loss term for soil, which is labeled "sink DOC" (the modeling term referring to losses in a term).

B7-25. Net ion exchange and loss from salt precipitation processes may occur within the soil, but Figure C2-1 refers only to the net balance between applied salt, drained salt, and salt remaining in the soil.

B7-26. Time and costs may also be factors that govern monitoring methods. Measurements of trihalomethane formation potential (THMFP) require 5 days and may be costly (e.g., $500 per test); these factors may make such measurements impractical for operational monitoring purposes. However, use of the field automated TOC analyzers suggested by DWR (Comment B7-10) may be an excellent monitoring method.

B7-27. These comments refer to the water quality experiments conducted for the Delta Wetlands Project. During the water right hearing for the Delta Wetlands Project and in comments on the 1995 DEIR/EIS, the estimates of DOC loading on the Delta Wetlands islands under agricultural, reservoir, and wetland habitat conditions were debated at length. One element of this debate was the validity and application of the results from the experiments described in Appendix C3 of the 1995 DEIR/EIS. The 2000 REIR/EIS presents a revised analysis of potential project effects on DOC that uses a broader range of DOC loading estimates than that used in the 1995 DEIR/EIS.

The water quality experiments conducted to support the Delta Wetlands Project impact analysis provide information for the impact assessment; with the monitoring recommended in Mitigation Measures C-1 through C-7, however, actual project effects could be compared with predictions based on these small-scale experiments, and project operations could be based on actual measurements. See response to Comment B7-9 for information about the incorporation of results of the SMARTS experiments into the 2000 REIR/EIS assessment of DOC loading rates.

B7-28. The commenter may be correct; there may have been insufficient information available to conclude what the source of salts and DOC were in the experiment. However, the 2000 REIR/EIS supplements the results of this experiment with other estimates of DOC loading from peat soils. Chapter 4 of the 2000 REIR/EIS (see Chapter 3C in FEIS Volume 1) provided an updated evaluation of potential project effects on DOC concentrations in Delta exports based on a wide range of values for potential DOC loading from the reservoir peat soils.

B7-29. The seasonal storage experiment started with ponds where vegetation had decayed. For a period of 3 months, DOC and salt concentrations did not increase, suggesting that the peat soil leaching, which continued for those 3 months, was not sufficient to increase concentrations substantially.

An impact assessment should be based on the combined results of any water quality experiments. The impact assessment presented in Chapter 3C of the 1995 DEIR/EIS was based on such a combination of experimental results. The impact assessment in the 2000 REIR/EIS (see FEIS Volume 1, Chapter 3C) was based on these results and the additional estimates of DOC loading obtained from the results of DWR's SMARTS

experiments and from testimony at the 1997 water rights hearing. The 2000 REIR/EIS impact analysis used a range of DOC loading rates to reflect the uncertainty in interpretation of available information.

The recommendation for ongoing monitoring of water quality variables proposed in Mitigation Measures C-1 through C-7 is based on the assumption that actual values under project operations would need to be observed for effects to be described most accurately and, if necessary, mitigated during project operations. Additionally, the Delta Wetlands Project WQMP calls for similar monitoring and adjustment of operations to prevent project effects on DOC (see the Delta Wetlands–CUWA agreement in the Appendix to the Responses to Comments).

B7-30. Jones & Stokes is confident in the agricultural drainage measurements being conducted by DWR on the four islands; these measurements were supplemented only to obtain estimates of source loads. DWR's simultaneous measurements of drainage flow and drainage concentration from Twitchell Island have further enhanced the data available for assessing the contributions of Delta water quality variables in discharges from Delta islands. These data are discussed in Appendix G of the 2000 REIR/EIS.

B7-31. The possibility that the water treatment plant (WTP) model underestimates the production of brominated THM species was fully discussed in Appendix C5 of the 1995 DEIR/EIS. Appendix G of the 2000 REIR/EIS compared the revised THM equation with the original THM equation; see "Calculations Using the Malcolm Pirnie Equation". The revised equation is more sensitive to a change in bromide but less sensitive to a change in DOC. The 2000 REIR/EIS also evaluated impacts of the predicted changes in THM concentrations using the new THM standards (see Chapter 3C of FEIS Volume 1).

See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for a description of the findings of the NEPA and CEQA impact analyses, proposed mitigation, and protection provided by the Delta Wetlands Project WQMP.

B7-32. The stipulated agreements with DWR and USBR described in Appendix A of the 2000 REIR/EIS ensure that Delta Wetlands operations will not interfere with CVP or SWP operations or cause a violation of standards. Coordination of monitoring and operations would most likely occur through the CALFED Ops Group and a daily exchange of Delta flow and water quality information available from DWR and USBR. Monitoring required by the FOC and the WQMP support this exchange of data and coordination with DWR and USBR. See responses to Comments B6-49 and B7-1 for more information.

B7-33. Chapter 3F of the 1995 DEIR/EIS and of FEIS Volume 1 analyzes the effect of Delta Wetlands Project operations on entrainment of Delta fish at the SWP and CVP pumps. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for information on the protections provided to aquatic species and habitat by the federal and state biological opinions.

B7-34. Since this comment was submitted, Delta Wetlands' operating parameters have become more defined through incorporation into the project description of the FOC and terms of stipulated agreements between Delta Wetlands and DWR, USBR, and other parties. See Appendix B, "Delta Wetlands Project Final Operations Criteria", of the 2000 REIR/EIS.

B7-35. North Bay Aqueduct diversions are not included in the definition of Delta exports used to determine the E/I ratio in the 1995 WQCP; therefore, they were not included in the definition of future export pumping capacity on page 2-6 of the 1995 DEIR/EIS (see page 2-7 of FEIS Volume 1). However, North Bay Aqueduct pumping is calculated similar to other in-Delta diversions and does affect the calculation of net Delta outflow, which is regulated under the 1995 WQCP.

B7-36. Monthly simulations of operations (using DWR's model DWRSIM and USBR's model PROSIM) are currently the best available tools for estimating Delta inflows and upstream operations. DeltaSOS, the monthly operations model used to conduct impact assessment of the Delta Wetlands Project, uses the initial water budget developed from results of simulations performed by DWR using DWRSIM. The impact assessment performed for the 1995 DEIR/EIS is therefore consistent with the currently available assessment models and with current practice. Actual daily operations of the Delta Wetlands Project would be based on daily Delta conditions and ongoing monitoring and would differ from the DeltaSOS results based on monthly average conditions.

B7-37. Assumptions used for the 1995 DEIR/EIS impact assessment included the assumption that Delta Wetlands Project discharges would be allowed any time that export capacity exists at the SWP and CVP pumps. This assumption allowed for evaluation of the maximum possible adverse project impacts, but may have resulted in overstatement of the water supply benefits. The 2000 REIR/EIS analysis included a scenario in which Delta Wetlands discharges were limited by south-of-Delta delivery deficits.

B7-38. Water diverted onto reservoir islands for shallow-water management would be subject to the same discharge restrictions as water diverted onto the reservoir islands for storage. The FOC included in the federal and state biological opinions for the Delta Wetlands Project include several restrictions on Delta Wetlands discharges in April and May, including prohibition of all discharges from Webb Tract. Consequently, the monthly simulations of project operations performed for the 2000 REIR/EIS show no Delta Wetlands discharges for export during these months for any of the years in the 73-year simulation.

B7-39. See response to Comment B7-38.

B7-40. The summary statement referred to by the commenter at the end of the next to last paragraph on page 3-5 of Chapter 3 of the 1995 DEIR/EIS is somewhat incorrect; the restrictions are better described under "Permitted pumping rate" in the list on page 2-6 (FEIS Volume 1, page 2-7). The last sentence of the next to last paragraph on page 3-5 of the 1995 DEIR/EIS (see page 3-6 of Chapter 3 of FEIS Volume 1) has been revised as follows:

> The current pumping level is limited to a daily average of 6,680 cfs by the requirement for a USACE permit for exceedance of this rate (the restrictions for the period of December 15 to March 15, as interpreted by DWR, allow a combined rate of 11,700 cfs in December and March and a combined rate of 12,700 cfs in January and February).

Full terms of the notice under which DWR increases its pumping during this period and simulation of those terms are described on page A2-8 in Appendix A2, "DeltaSOS: Delta Standards and Operations Simulation Model".

B7-41. A continuous SWP pumping rate of 10,300 cfs for a month was simulated for cumulative future conditions with DWR's Interim South Delta Program. See page A2-8 of Appendix A-2 of the 1995 DEIR/EIS for a complete discussion of SWP pumping capacity and limitations.

For purposes of impact assessment, DeltaSOS simulated all potential CVP and SWP pumping before estimating the amount of water available for Delta Wetlands diversion or the pumping capacity available for export of Delta Wetlands diversions. The effect of this DeltaSOS assumption was to reduce the amount of water available for Delta Wetlands diversions and reduce the opportunity for Delta Wetlands discharge for export, providing the most reasonable estimate of likely project operations and eliminating the possibility of simulating project diversions and discharges in the same month.

B7-42. Average exports were 218 TAF/yr in the 21 wet years of the simulation presented in the 1995 DEIR/EIS analysis. If these years are eliminated from the analysis, the average export amount for the remaining 49 years is 175 TAF/yr, which is less than the overall average of 188 TAF, but not 80 TAF less. The 2000 REIR/EIS reevaluated discharge opportunities under the proposed project with incorporation of the FOC restrictions into project operations. Incorporating the FOC restrictions reduces project discharges to export.

B7-43. The commenter notes that the revenues generated by annual project water sales should have been estimated based on average discharges rather than average diversions. This is not only true for water sales under Alternative 1, but also for water sales under Alternatives 2 and 3. As a result, the estimated annual water sales would be lower than those reported in Chapter 3K of the 1995 DEIR/EIS. This correction has been made to the estimates in Chapter 3K based on the results of the simulations in the 1995 DEIR/EIS.

Additionally, limits on Delta Wetlands Project diversions and discharges required by the FOC and other terms of the state and federal biological opinions would further reduce the estimated annual water sales for the proposed project. For example, project discharges for export reported in the 2000 REIR/EIS for Alternatives 1 and 2 were estimated to be a maximum of 138 TAF/yr based on the monthly simulations and 1995 level of demand for water. Based on this estimated project yield and the water price of $200–250 per acre-foot used in the 1995 DEIR/EIS, annual revenue from water sales would be estimated at a maximum of $28–35 million for Alternatives 1 and 2. It should be noted that the estimates

of revenue presented in Chapter 3K are for purposes of comparing the alternatives and are not meant to provide a precise estimate of annual revenues for the project.

B7-44. As noted by the commenter, releases are made from Oroville and Shasta Reservoirs for fish and wildlife enhancement, in addition to supplying diversions and exports and helping to meet Delta outflow requirements. This correction does not change the impact evaluation or the conclusions of the NEPA and CEQA analysis.

B7-45. The information provided by the commenter has been noted. This correction does not alter the impact analysis. The assumptions included in DWRSIM were used in DeltaSOS for consistency with DWR's methods.

B7-46. One application of DeltaSOS is to confirm DWRSIM results of Delta operations. As stated in Appendix A2, DeltaSOS tests each input matrix against calculated Delta channel flows for each month of the simulation period. If a specified standard is not satisfied, some action within the Delta would be required to meet the specified standard. Necessary adjustments, including "imaginary water", are accounted for and reported by DeltaSOS. Table A3-8 in Appendix A3 provides annual summaries of necessary adjustments. The assessment in the 2000 REIR/EIS does not adjust DWRSIM estimates of required Delta outflow or inflows.

B7-47. The North Bay Aqueduct is not included in the definition of Delta exports used to determine the E/I ratio in the 1995 WQCP; therefore, it was not included in the definition of future export pumping capacity on page A3-3. However, North Bay Aqueduct pumping is calculated similar to other in-Delta diversions and does affect the calculation of net Delta outflow, which is regulated under the 1995 WQCP.

B7-48. The commenter is correct in noting that the annual totals in Table A3-4a are incorrect. The correct values are shown in Table A3-1, in the column labeled "Banks & Tracy Pumping". These data were replaced in the 2000 REIR/EIS analysis with mean annual input data from DWRSIM study 771; see Table 3-1 in the 2000 REIR/EIS.

B7-49. If measurements showed that DOC concentrations in water stored on the Delta Wetlands reservoir islands exceeded a specified mitigation trigger, release of the stored water would have to be conducted slowly; the release rate also would be subject to modification based on continued monitoring of DOC concentrations in the stored water and in the receiving channels. Chapter 4 of the 2000 REIR/EIS (see FEIS Volume 1, Chapter 3C) describes how the proposed mitigation of DOC increases would be implemented to control Delta Wetlands Project effects on export DOC concentrations under extreme (worst-case) DOC loading conditions. It also discusses how the mitigation would be adjusted to meet any mitigation requirement specified in water right permit terms for the project. Detailed monitoring requirements and Delta Wetlands operations changes are also described in the WQMP negotiated by Delta Wetlands and CUWA.

B7-50. The potential release of algae from the reservoir islands in discharges for export was identified as an impact in the NEPA and CEQA analysis (see Impact C-7, "Changes in Other Water Quality Variables in Delta Channel Receiving Waters", in the 1995 DEIR/EIS [page 3C-34 in Chapter 3C of FEIS Volume 1] Algal monitoring is included in Mitigation Measure C-7 in Chapter 3C, "Water Quality", of the 1995 DEIR/EIS and of FEIS Volume 1: "Restrict Delta Wetlands Discharges to Prevent Adverse Changes in Delta Channel Water Quality". This measure would require Delta Wetlands to monitor water quality variables, including chlorophyll, in water stored on the reservoir islands during intended discharge periods and in Delta channel receiving waters. Levels of the variables in stored water and receiving water would be related using the expected dilution ratio at each location of a discharge pumping station. Delta Wetlands would estimate the dilution ratio based on channel flow rates and intended discharge rates using specified mixing-zone assumptions. Project discharges would be limited as needed to prevent significant adverse effects on levels of these variables in the receiving channels. Delta Wetlands will be required to submit reports of measurements to the SWRCB.

B7-51. The Delta Wetlands Project is analyzed as a stand-alone water storage facility, operated independently of the SWP and CVP. Because Delta Wetlands operations were evaluated as being independent of SWP and CVP operations, no changes to reservoir operations would occur, and using DWRSIM to simulate project operations directly would have produced results similar to those obtained using DeltaSOS. See also Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

B7-52. Although daily simulations of flow provided useful information, impact assessment methodologies are based on the initial water budget developed from the results of monthly simulations performed by DWR using DWRSIM. See responses to Comments A2-8 and B7-36.

Actual daily operations of the Delta Wetlands Project would be based on daily Delta conditions and ongoing monitoring, as described in the FOC and illustrated in Appendix F of the 2000 REIR/EIS.

B7-53. The impacts of Delta Wetlands operations on Delta outflow were evaluated in the 1995 DEIR/EIS. The analysis of water supply and hydrodynamic effects of the Delta Wetlands Project was based on net channel flow changes under Delta Wetlands Project operations (see Chapter 3B of Volume 1 of this FEIS and Appendix B1 of the 1995 DEIR/EIS). The impact assessment of fishery effects included consideration of the tidal flow transport that would cause some Delta Wetlands discharges to mix downstream toward the bay. See also Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow".

B7-54. The commenter is correct in noting that take limits for endangered fish species at the SWP and CVP pumping facilities could reduce Delta Wetlands Project operations. However, for purposes of impact assessment using the DeltaSOS model, a "worst-case" scenario was

assumed in the 1995 DEIR/EIS in which all water discharged from the project reservoir islands would be exported through the SWP and CVP; such a level of exports would have the greatest detrimental effect on water supply, hydrodynamics, water quality, and fishery resources. The stipulated agreement between Delta Wetlands and DWR that was submitted to the SWRCB during the 1997 water right hearing specifies that Delta Wetlands must stop or reduce reservoir releases if the SWP or CVP would have to modify operations to meet a legal requirement (e.g., ESA take limits) because of the Delta Wetlands Project discharges. These restrictions would apply to real-time project operations. The presence of fish, which triggers these restrictions, is unpredictable, and speculation about the presence of fish would be necessary for the restrictions to be modeled. For these reasons, the DeltaSOS simulations did not include reductions in project operations related to CVP and SWP take limits.

B7-55. The monthly version of the Kimmerer-Monismith equation is used directly in DeltaSOS. The end-of-month X2 value is calculated from the previous X2 location and the monthly outflows as described on page A2-7 in Appendix A2 of the 1995 DEIR/EIS.

B7-56. The commenter is correct in noting that calibration of the hydrodynamic model did not involve flow data and that flow-split verification was not performed for the model. Model calibration involved only tidal stage measurements. This is noted on page B1-4 of Appendix B1, "Hydrodynamic Modeling Methods and Results for the Delta Wetlands Project". Flow split estimations are based on the hydrodynamic model results. Direct hydrodynamic calibration of the Resource Management Associates (RMA) model with channel flows and velocities has not been possible because flows and velocities have been measured routinely in the Delta channels at only a few locations.

B7-57. The restrictions on SWP pumping, as interpreted by DWR, are discussed in the passage that immediately follows the statement referred to by the commenter, under "Permitted pumping rate". As the commenter notes, DWR monthly pumping is often less than capacity. DWRSIM and DeltaSOS values reflect this.

Full terms of the notice under which DWR increases its pumping during this period and simulation of those terms are described on page A2-8 in Appendix A2, "DeltaSOS: Delta Standards and Operations Simulation Model", of the 1995 DEIR/EIS. See response to Comment B7-40.

B7-58. As described in Chapter 3, "Water Supply and Operations", of the 2000 REIR/EIS (Chapter 3A in Volume 1 of this FEIS), the results of DWRSIM study 771 were used as the basis of simulations of Delta Wetlands Project operations performed using DeltaSOS. DWRSIM study 771, which uses 1995 hydrology and demands, is the currently accepted standard that CALFED and other state water planners use to represent baseline conditions. When the 1995 level of development for SWP/CVP project demands and deliveries is used, it is possible to evaluate the greatest level of Delta Wetlands operations likely to occur. Results for Delta Wetlands operations would differ slightly if demands and deliveries under a 2020 level of development were assumed with existing facilities.

B7-59. Appendix A4 describes net daily flows in the Delta; tidal flows and tidal operations, which include operation of the Clifton Court gates, are not described. The Clifton Court gates are operated to balance the daily export pumping rate; they would be operated for a period sufficient to fill Clifton Court to match daily pumping. Daily operations of the Delta Wetlands Project, including movement of discharged water through the Clifton Court Forebay intake gates, would need to be planned through coordination with the CALFED Ops Group (see response to Comment B6-49). Therefore, the way that water released from the Delta Wetlands islands would be coordinated with operation of the intake gates is subject to the review and direction of the CALFED Ops Group. The commenter's recommended addition to Appendix A4 has been noted; however, this change does not affect the conclusions of the environmental analysis presented in the 1995 DEIR/EIS.

B7-60. Because the Delta Wetlands Project is assumed to operate independently of the SWP and CVP, project operations cannot affect instream flows. The effects of project operations on outflow were included in the simulations of project effects. The FOC terms now incorporated into the proposed project include numerous restrictions on project operations that limit potential effects on outflow and X2. The project cannot operate outside the parameters established in the FOC.

B7-61. See response to Comment B7-6.

B7-62. Many factors that may have significant effects on fishery resources, including extreme tides, weather (barometric pressure), and variable temperatures, are not incorporated into the hydrodynamic simulations or included in the fishery impact assessment.

The best available information and tools were used in the impact analysis and development of mitigation. The fishery analysis was based on the monthly average distribution of species of interest. The average tidal exchange mixing was a factor in the fishery impact assessment. The simulated tidal exchange mixing was incorporated into the assessment of fish transport and entrainment. Differences between the spring and neap tidal conditions were not considered. Adaptive operations criteria that use real-time or near-real-time information are included in the FOC to minimize and avoid significant impacts attributable to extreme conditions.

B7-63. The mitigation measures proposed to reduce project effects on fishery resources have been replaced with the FOC and RPMs described in the biological opinions. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions". The FOC terms include a monitoring program that is summarized in Master Response 4. As stated in the FOC, Delta Wetlands will be solely responsible for conducting the required monitoring. Delta Wetlands will work with DFG to determine whether information can be processed quickly enough to accommodate adaptive management. The FOC state:

> [Delta Wetlands] shall work directly with CDFG to resolve daily technical monitoring issues but may convene the Monitoring Technical Advisory

> Committee to act in a technical capacity to provide review and address any technical inadequacies or disagreements that may occur.

In addition, the USFWS biological opinion includes the following term:

> The Corps shall minimize the impacts on delta smelt associated with normal operation of the reservoir and habitat islands including filling and discharging water as described above or historical operation of the islands for agricultural production by implementing the avoidance, minimization, and compensation measures contained in the Final Operations Criteria and Fish Monitoring Program (January 27, 1997). The Draft proposed Delta Wetlands Fish Monitoring Program shall be finalized at least 90 days prior to the start of any project related construction.

For more detail, see the attachment to the FOC entitled "Delta Wetlands Fish Monitoring Program" in Appendix B of the 2000 REIR/EIS.

B7-64. Available information does not indicate that structures along the Delta channels—including boat docks, pilings, or diversion stations with fish screens—would increase predation to a level that would cause significant impacts. Chapter 5 of the 2000 REIR/EIS (see Chapter 3F in FEIS Volume 1) included updated information about the potential effects of boat docks and pilings on the vulnerability of prey species and success of predator species. Based on the literature search conducted to address this issue, it was concluded that installation of boat docks is not likely to affect fish predator-prey interactions significantly for the following reasons:

- Pilings and shade associated with boat docks or fishing piers are used for cover by both predators and prey.

- The structurally simple forms of cover provided by the fish screens, intake facilities, boat docks, and fishing piers would attract fewer fish species than more complex forms of cover such as brush piles (e.g., instream woody material) or aquatic plants.

Also, the Delta Wetlands intake, discharge, and recreation facilities would be constructed on relatively steep levee slopes. These locations are not believed to be areas of preferred spawning or rearing habitat for prey species, so the species' vulnerability would not be expected to change substantially. The boat docks would be adjacent to the shoreline and would not extend across a substantial proportion of a channel's width. Based on the preliminary design for the project facilities (see Appendix 2), the boat docks are expected to be floating docks that extend less than 50 feet into channels; the minimum channel width is approximately 400 feet. Juvenile salmon that move along the shore could continue to move under boat docks. Juvenile salmon that move with the main channel flow would not be affected by or come into contact with the boat docks.

A new mitigation measure is proposed to reduce the number of boat slips that Delta Wetlands may construct; implementation of this measure reduces the impacts that could result from recreation use associated with the proposed project. This measure is described under "Additional Mitigation of Potential Impacts: Reduction in Boat Slips at Recreation Facilities" in Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

The commenter is also concerned about the potential for predation at the intake facilities and fish screens. The following additional factors reduce the potential for increases in predation associated with Delta Wetlands' diversion facilities and fish screens:

The fish screens would not be in place year round, but only during the diversion period.

The low approach velocity for the fish screens (equal to or less than 0.2 fps) would protect fish within the influence of the diversions. The draw toward the diversions would be small because velocities toward the diversions would decrease with distance; a few yards away from the screens, flow toward them would be difficult to detect. (See response to Comment B6-60 for additional information about the design of the fish screens.)

Most of the time, bypass flows would be created by tidal currents near the Delta Wetlands diversion facilities, and slack periods would probably last less than an hour between each tidal cycle.

Given these factors, the fish screens and diversion facilities would not be expected to concentrate or disorient juvenile salmonids and other fish species.

Additional information about predation and the issue of reverse flows was included in the biological assessment "Effects of the Central Valley Project and State Water Project on Delta Smelt and Sacramento Splittail" prepared by DWR and USBR (U.S. Bureau of Reclamation and California Department of Water Resources 1994). In the USBR/DWR assessment, reverse flows were not found to be associated with entrainment of delta smelt and splittail. Entrainment of delta smelt appeared to increase when outflow was less than 10,000 cfs (page 195 in the USBR/DWR assessment); entrainment of splittail was observed to be a function of abundance (page 196 in the DWR assessment).

Also, the USBR/DWR assessment discussed the possibility that increased predation on delta smelt and Sacramento splittail may be caused by increases in water clarity and introduced species (pages 104–106 and 169 in the USBR/DWR assessment). Physical features of the Delta Wetlands Project (fish screens, boat docks, and outlet siphons) would not increase water clarity and would be unlikely to substantially increase predator abundance for the species discussed in the USBR/DWR assessment. Catfish, striped bass, and sunfish were well established in the estuary before delta smelt and splittail declined. Several species (e.g., striped bass) declined concurrently with splittail and delta smelt.

Other species that may prey on delta smelt and splittail (e.g., silversides) are not associated with habitats that would be created by the Delta Wetlands facilities.

B7-65. The FOC terms include a measure to preserve 200 acres of shallow-water rearing and spawning habitat to compensate for project impacts on habitat. The DFG RPMs also include the requirement that Delta Wetlands deposit monies into an aquatic habitat restoration water fund, which will be used by DFG to pay for environmental enhancements that benefit winter-run chinook salmon and delta smelt. See "Alteration of Habitat" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

B7-66. The information on life histories of delta smelt and splittail that was provided in the biological assessment and the 1995 DEIR/EIS was sufficient for analysis of potential project impacts. USFWS issued no-jeopardy opinions for project effects on both species. USFWS's 1997 biological opinion on Delta Wetlands Project effects on delta smelt (Appendix E of the 2000 REIR/EIS) includes information on the life histories of both delta smelt and splittail. Attachment 4 of the DFG biological opinion (Appendix C of the 2000 REIR/EIS) also includes life history summaries for splittail and delta smelt. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for information on project operating restrictions that provide protections for splittail.

B7-67. Variable timing of juvenile migration is described in detail on page A-4 in Appendix A of the biological assessment for Delta Wetlands Project effects on fish species (Appendix F2 of the 1995 DEIR/EIS). The text does not identify the source for PRIV (the estimated proportion of juvenile production in the river at the beginning of a month) and PSMOLT (the monthly proportion of annual production that moves downstream during smoltification). PRIV is initially calculated from the data shown in Figure 4-2 (in Chapter 4 of the biological assessment); PSMOLT is also shown in Figure 4-2.

The analysis of the effects of agricultural and habitat island diversions on winter-run survival is explained on pages A-3 and A-4 in Appendix A of the biological assessment. Effects on winter-run survival are a function of Delta flow conditions; therefore, the effects of agricultural and habitat island diversions on winter-run survival depend on how flow conditions are affected by agricultural and habitat island diversions (as represented by changes in the cross-Delta flow parameter).

B7-68. See response to Comment A7-3.

B7-69. See response to Comment B7-50.

B7-70. See response to Comment B6-60 regarding details of fish screen design that were developed through consultation with DFG, NMFS, and USFWS.

Existing information does not support the contention that fish would be drawn toward and concentrated at the Delta Wetlands diversions. See response to Comment B7-64 regarding the potential for predation at the Delta Wetlands facilities and the issue of reverse flows.

B7-71. The text referred to by the commenter on page 3F-5 of Chapter 3F of the 1995 DEIR/EIS (page 3F-6 of Volume 1 of this FEIS) identifies reverse flow as a potential factor increasing entrainment loss, not as a definite factor. The inconsistency between this comment and Comment B7-70 indicates the unresolved nature of the question of transport and reverse flow. Tidal flows move eggs and larvae upstream and downstream relative to a given location but do not necessarily result in net movement. Net flows, however, may result in net movement of eggs and larvae, especially when tidal flows move the eggs and larvae into relatively narrow channels (e.g., Old and Middle Rivers), where net flows may have an increased effect.

B7-72. The commenter is correct in clarifying the statement about the distribution of delta smelt. The second sentence of the third full paragraph on page 3F-6 of the 1995 DEIR/EIS (page 3F-7 of FEIS Volume 1) indicates that under natural outflow conditions, delta smelt larvae are carried downstream to near the upstream edge of the entrapment zone (e.g., 2-parts-per-thousand [ppt] salinity), where they typically remain and grow to adult size. Although they generally remain near this upstream edge of the entrapment zone, delta smelt maintain a broad distribution and are not concentrated in one narrow salinity band; they may occur in fresh water or in water with salinity that exceeds several parts per thousand.

B7-73. The text under "Factors Affecting Abundance" on page 3F-6 in Chapter 3F of the 1995 DEIR/EIS (page 3F-7 of Volume 1 of this FEIS) states that high outflow provides improved habitat conditions in Suisun Bay. The improvement is a function of salinity (i.e., delta smelt are generally found where salinity is less than 2 ppt). The importance of the Delta as habitat for delta smelt is a function of outflow; in general, Delta habitat is most important during low outflow conditions.

B7-74. Information provided on page 3F-7 of Chapter 3F of the 1995 DEIR/EIS (page 3F-8 of Volume 1 of this FEIS) indicates that splittail are found *primarily* in the Delta except during spawning migration and during the early rearing of juveniles. This is not inconsistent with more recent information on splittail distribution. The information on splittail that was provided in the biological assessment and the 1995 DEIR/EIS included details that supported the proposal to list the species as threatened under the federal ESA (59 FR 862, January 5, 1994); this information was sufficient for analysis of potential project impacts. USFWS's May 1997 biological opinion for project effects on delta smelt incorporated a conference opinion on project effects on splittail; USFWS formally adopted the conference opinion as its no-jeopardy biological opinion in April 2000. See response to Comment B7-66 regarding information on splittail life history; see also Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for information on project operating restrictions that provide protections for splittail.

B7-75. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for information on the way in which FOC terms will restrict Delta Wetlands Project effects on channel temperatures.

B7-76. See response to Comment B6-60 regarding the details of the fish screen design developed during federal and California ESA consultation. Also, USFWS issued a no-jeopardy opinion for project effects on splittail in April 2000. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for information on project operating restrictions that provide protections for splittail.

B7-77. See response to Comment B7-63.

B7-78. See response to Comment B7-63.

B7-79. This comment refers to the biological assessment (Appendix F2 of the 1995 DEIR/EIS). See responses to Comments B7-72 and B7-73 regarding the distribution and abundance of delta smelt. The commenter refers to a sentence on page 4-10 of the biological assessment; in this sentence, the word "since" should have been "during", and the sentence should have stated that during the 1986–1992 drought, most delta smelt were almost entirely absent from Suisun Bay and Suisun Marsh.

B7-80. The first sentence in the first full paragraph on page 4-14 of Appendix F2 of the 1995 DEIR/EIS should read as follows: "Fall midwater trawl surveys provide the longest conducted, best available index of splittail abundance".

B7-81. The information provided is from USFWS and was published in the Federal Register (59 FR 862, January 6, 1994).

B7-82. The migration rate is the proportion of the population that is estimated to enter the Delta during a given month. High river flows, especially during December and January, may cause a greater proportion of the population to move downstream to the Delta than low river flows. See response to Comment B7-67.

B7-83. Fishery surveys conducted in 1995 indicated that the San Joaquin River system upstream of the Delta was used extensively for spawning. The Delta channels around the Delta Wetlands islands have not been shown to support extensive splittail spawning, although the channels may provide rearing habitat. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for information on project operating restrictions that provide protections for splittail.

Letter B8

STATE OF CALIFORNIA -- BUSINESS, TRANSPORTATION AND HOUSING AGENCY PETE WILSON, Governor

DEPARTMENT OF TRANSPORTATION
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December 21, 1995

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Mr. Jim Munroe
California Water Resources
Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

Dear Mr. Munroe:

Thank you for the opportunity to review the Draft Environmental Impact Report (DEIR)/Draft Environmental Impact Statement (DEIS) for the proposed Delta Wetlands project. Our comments are provided below. Please note that Caltrans has an active water rights protest on this project. The issues contained in that protest remain valid and need to be resolved. We appreciate recent activities on the part of the two lead agencies and the applicant to meet with Caltrans and discuss issues of concern to this Department regarding the Delta Wetlands project in a mutual effort to move towards resolution of these issues.

Chapter 3L Affected Environment and Environmental Consequences-Traffic

- *Criteria for Determining Impact Significance*

The DEIR needs to address potential project effects to planned future highway widening. This item should be added as a criteria for determining project related and cumulative traffic impacts and mitigation (Page 3L-7) and fully assessed for each alternative. A project should be considered to have a significant effect on the highway if it would result in a decreased feasibility for future planned highway improvements. **B8-1**

- *Impacts and Mitigations*

For each alternative the traffic analysis contained in the DEIR indicates that the project alternative would result in the addition of more traffic than the daily volume of traffic needed to be considered a significant project related impact. These additional peak hour trips added to roadway segments, which will already be at unacceptable LOS under future traffic conditions, results in an impact which is considered significant and unavoidable. The DEIR indicates no mitigation is available to reduce this impact. Explanation for this is given in the Chapter Summary on Page 3L-1, which states that "although implementing the Caltrans route concepts for State Route 4 and State Route 12 would reduce this impact to a less than significant level, no funding sources have been identified by Caltrans to implement this measure".

In specific regard to State Route 12 on Bouldin Island, the finding that the traffic impacts are unavoidable and no mitigation is available is not accurate and must be modified and re-analyzed. A project to widen and add passing lanes on State Route 12 across Bouldin Island is included in the San Joaquin Council of Governments' 1994 Regional Transportation Plan (RTP). This is the official plan for regionally significant transportation improvements in San Joaquin County. By State and Federal law, this plan must be "funding constrained". It can only include projects for which funding can be identified as available over the 20-year planning period. Therefore, the State Route 12 project on Bouldin Island is within the transportation funding resources expected to be available in San Joaquin County. Additionally, this improvement on State Route 12 is also included in the current "Measure K" Strategic Plan of the San Joaquin County Local Transportation Authority, which identifies how sales tax revenue dedicated for transportation purposes in the County will be expended. **B8-2**

Given the inclusion of this project in these formal transportation planning documents, this project must be identified as an available and feasible measure to mitigate for future traffic conditions that are projected to occur on Route 12. Therefore this chapter of the EIR/s needs to be fully revised using the significant new information provided above.

In regard to Chapter 3E-Affected Environment and Environmental Consequences-Highway and Utilities, Page 3E-5, Criteria for Determining Impact Significance, the environmental document needs to address the project effects to on-going roadway maintenance and planned future widening. The project effects to ongoing roadway maintenance and planned highway widening need to be added as criteria for determining impact significance. These criteria need to be fully assessed for each project alternative. A project alternative should be considered to have a significant impact on highways if it would result in a decreased feasibility for on-going or future facility improvements (i.e., widening). **B8-3**

Concerning Chapter 3 E-6, subheading Bouldin Island, the information in this section does not adequately address construction of Alternative 1 (and later 2) and future land uses on Bouldin Island. The document needs to be revised to include a comprehensive review of implementation effects on the Habitat Management Plan (HMP) to planned State Route 12 facility improvements (which will also be serving as a traffic mitigation measure). **B8-4**

Implementation of Alternative 1 or 2, which creates sensitive wildlife habitat to the edge of the existing right of way of Route 12, would not be compatible with planned and feasible improvements to State Route 12, as previously discussed. The creation of riparian areas, seasonal wetlands and other high value habitat immediately adjacent to the highway would have a significant and detrimental effect on these improvements. Widening the highway (which future traffic projections indicate is needed and which is a planned improvement that is recommended to be identified as a mitigation measure in this DEIR) under Alternative 1 or 2 would necessitate that a portion (see below) of this habitat area would be needed. This would increase the environmental effect of this subsequent highway project, potentially substantially increasing it's mitigation and permitting requirements (and the related costs). This could also effect the design requirements of the highway project and make it more difficult to be constructed. These impacts need to be identified in the DEIR. It should also be recognized that the design criteria of the HMP states that it is the goal of the plan to take advantage of, rather than disrupt, large existing infrastructure. It appears that the Plan, as currently proposed for Alternatives 1 and 2, would disrupt and potentially delay future improvements to State Route 12. The HMP also appears to indicate that high value habitat for special status species and waterfowl will be located directly adjacent to State Route 12. This also suggests that a reconfiguration of the Plan be considered so that low value habitat species would be located directly adjacent to the Route 12 corridor. **B8-5**

Finally, the DEIR needs to recognize that there is a clear public need for the planned highway improvement on State Route 12. Traffic volumes in the corridor are projected to nearly double in the next 15 years, leading to highway break-down conditions unless the necessary improvements are made. Highway traffic includes 18% trucks making it a major freight corridor. It is the only major east/west highway connecting the North Bay Area and the San Joaquin Valley between Sacramento and Stockton. It is most logical to handle the projected increase in travel demand by improving the highway in its current configuration. **B8-6**

From the perspective of public policy and interagency coordination there are a number of public benefits for recognizing the future highway widening in conjunction with development of the Delta Wetlands project. Conversely, it does not make good public planning sense to establish a habitat program for one project which would be impacted and altered by a needed and planned highway improvement and which could complicate and increase the cost of this subsequent highway improvement.

In order to improve the highway, Caltrans has identified the future need for approximately 100 additional feet of right of way extending south from the existing highway right of way line. Additional right of way would be needed to add an additional bridge at the Mokelumne River and at Potato Slough; however, this additional right of way need has not been determined at this time. **B8-7**

The Department is currently working with the two lead agencies and the project applicant to re-look at the geographic layout of the HMP, and the establishment of newly created habitat areas in the areas immediately adjacent to the south side of State Route 12. Consideration is being given to moving the higher value habitat identified as abutting the highway to other locations and locating agricultural uses in proximity to the highway. Additionally, consideration is being given to re-designating the boundary of the HMP to approximately 100-feet south of the existing highway right of way.

Further, discussions between the two lead agencies, the applicant and Caltrans, concern the location of a 5-foot high and 20-feet wide berm which would be constructed in close proximity to the south right of way of the existing highway (although this berm does not appear in any cross-sections or diagrams contained in the DEIR). Additionally, the specific location of a drainage ditch in proximity to State Route 12, which would be between the berm and the highway, is also part of these discussions. Also, under discussion is the management of the 100-feet area south of the existing highway right of way. **B8-8**

Caltrans believes that reaching formal agreement on the above issues as they relate to the 100-foot corridor south of the existing highway is critical to resolving the impacts this project will have on the planned future improvements to State Route 12 on Bouldin Island. This formal agreement needs to be identified as a mitigation measure in the DEIR and identified as a condition of project approval. **B8-9**

Maintenance Agreement

In addition to the above issues, Caltrans understands that a berm and ditch will be located close to the existing right of way on the north side of the highway. Caltrans and the applicant need to enter into a Maintenance Agreement governing the maintenance and management of the water system, and the berms and ditches on both sides of State Route 12.

B8-10

This Agreement would cover how the ditches and berms will be maintained and how water will be pumped from the ditches. It will also cover any liability issues that relate to State Route 12. We request that this Maintenance Agreement be identified as a mitigation measure and that it be completed before construction begins.

Geotechnical Issues

Caltrans understands that under Alternatives 1 and 2 water elevations on Bouldin Island will not change significantly and that water will not be stored at elevations higher than present. Also that water will be retained in the same proximity to State right of way as it is at present for farming. Please verify that this statement is correct or indicate where there are differences with our understanding. Please indicate what "water elevations will not change significantly" means in detail for Alternatives 1 and 2 on Bouldin Island. B8-11

Alternative 3 proposes to place a spillway on the dam that would direct overflow onto State right of way. Ed Hultgren (Hultgren Geotechnical Engineers) states that this spillway is to provide an overflow for a levee break and the spillway was not placed as an overflow when overfilling of the dam occurred. The concern remains that the location of the spillway may place additional flooding potential on State Route 12. The spillway elevations and location would require additional study if this alternative was selected. If Alternative 3 is ever to be built, a review from the Caltrans Roadway Geotechnical section would be required.

A number of geotechnical concerns were addressed in the Water Protest (submitted in 1988) by Caltrans. The majority of these concerns were related to Alternative 3; these continuing concerns will be addressed in these comments. These geotechnical concerns are: [D] mud heave, [G] soils, [H] construction loading, [I] water levels, [K] levee design and [L] riparian areas. [The capital letters refer to letters that indicate the item in the Water Protest.] The following paragraphs address each item individually:

[D] *Mud Heave* - It is indicated at this time that mud heave will not be a problem in this peat material and with the proposed dam configuration. A further analysis of the possibility of mud heave occurring would be needed if Alternative 3 is chosen.

[G] *Soils* - The soils present in the Delta raise many geotechnical concerns. It appears that Alternative 3 can be constructed if proper engineering methods are employed to handle these unusual soils. The geotechnical design would need to be reviewed by Caltrans if Alternative 3 is selected. B8-12

[H] *Construction Loading* - Construction loads and the loading of the dam itself will present some geotechnical concerns which must be further addressed with Caltrans review if Alternative 3 is selected.

[I] *Water Levels* - If Alternative 3 was selected, considerable geotechnical information would be required by Caltrans to address the possibility of increased water within the State right of way. This information is not available in the DEIR.

[K] *Levee Design* - Alternative 3 presents the only concern for the design of the levees. The levee design must be addressed during the design phase with Caltrans review if Alternative 3 is selected.

If Alternative 3 is selected, a number of geotechnical concerns will be encountered and need to be addressed by the Caltrans Engineering Service Center.

Traffic Operations and Encroachment Permits

In regard to access to planned recreational facilities on Bouldin Island, the DEIR needs to recognize that there are currently no public road intersections with State Route 12 which provide access for these new facilities. Each new public access road connector to State Route 12 will require an encroachment permit from Caltrans and will require that the intersection meet public road connection standards and have left-turn channelization. B8-13

Caltrans recommends the applicant meet with District Traffic and Encroachment Permit staff to discuss in detail the proposed location of new public road intersections and what is required for an encroachment permit. B8-13 cont'd

Chapter 3I, Affected Environment and Environmental Consequences-Land Use and Agriculture

This chapter needs to address potential land use issues surrounding the existing State Route 12 facility and the planned expansion of that facility. At a minimum, the section should address impacts of the project to the existing facility, projected use and the need for planned facility improvements. B8-14

Appendix G3, Habitat Management Plan for the Delta Wetlands Habitat Islands, Habitat Types, Figure 4

Figure 4 shows free-roam hunting throughout the area surrounding State Route 12. The figure and associated text should be revised to accurately depict designated no-hunting zone set- backs along State Route 12. Hunting in the area along State Route 12 could create potential traffic hazards. B8-15

Appendix G5, Summary of Jurisdictional Wetland Impacts and Mitigation

The DEIR/DEIS does not contain a map showing existing wetlands mapped by the Natural Resources Conservation Service (NRCS), Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (FWS) and the U.S. Army Corps. of Engineers (ACOE). Tables G5-6 show the amount of Federal jurisdictional wetlands present on the project and habitat islands; however, the table does not convey the physical location of each wetland resource. The FEIR/FEIS should contain a map showing wetland ACOE verified boundaries. B8-16

In closing, we request that Caltrans be included in the process to develop, review and approve subsequent discretionary actions by the lead agencies for the detailed site and project element specific stages of this project, as a coordinating agency with responsibility to own and operate State highways within the project boundaries. We would like to receive the FEIR, Mitigation Monitoring Plan, staff reports and conditions of project approval when available. B8-17

Again, thank you for the opportunity to comment. If you have any questions, please contact me at the above referenced telephone number.

Sincerely,

William J. Costa

for DANA COWELL
Chief, Transportation
Planning Branch B

cc: Andrew Chesley/SJCOG
Peggy Kiernan/SJ County Planning

609540

California Department of Transportation

B8-1. Implementation of the Delta Wetlands Project would not reduce the feasibility of planned future highway improvements. The Delta Wetlands Project would change the land uses adjacent to the highway right-of-way (ROW) from agricultural to open space/habitat areas; however, it would not be inconsistent with future planned widening and would not involve construction of permanent structures that would make additional roadway widening infeasible.

B8-2. The direct and cumulative impacts on Delta roadways during operation of future projects, including the Delta Wetlands Project, are described in Chapter 3L. The 1995 DEIR/EIS has been amended to reflect that there is an existing source of funding for widening of State Route (SR) 12 and that Caltrans has initiated preliminary design and environmental compliance work for the widening of SR 12 on Bouldin Island (O'Conner pers. comm.). Additionally, Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities", describes a mitigation measure that would reduce traffic volumes under the proposed project. Therefore, cumulative impacts associated with level of service (LOS) on SR 12 may be mitigated to a less-than-significant level. The last two paragraphs on page 3L-18 and the first paragraph on page 3L-19 of the 1995 DEIR/EIS (page 3L-21 of FEIS Volume 1) have been revised as follows:

> Implementing Mitigation Measures L-4 and RJ-1 ~~could~~ would reduce Impact L-21 to a less-than-significant level. ~~However, as described below, there is no funding for implementation of this mitigation measure; therefore, this impact is considered significant and unavoidable.~~
>
> **Mitigation Measure L-4: Implement Caltrans' Route Concepts for SR 4 and SR 12.** ~~Although it is not currently programmed (i.e., funded),~~ Caltrans' route concepts for SR 12 across Bouldin Island and SR 4 in Contra Costa County are for four-lane highways in 2010 (Cowell and Johnson pers. comms.). This widening would include the sections of SR 4 south of Cypress Road and south of Delta Road and SR 12 west of Terminous. Caltrans has initiated preliminary design and environmental compliance work for the widening of SR 12 on Bouldin Island (O'Conner pers. comm.). The portion of SR 4 between the San Joaquin County line and I-5 would remain a two-lane highway because of the narrow bridges along that portion of the route. Table 3L-8 describes improvements in V/C ratio and LOS that would result from implementation of Caltrans' route concepts.
>
> ~~Although implementation of this mitigation would reduce this impact to a less-than-significant level, no funding sources have been identified by Caltrans to implement the concept plans for SR 4 and SR 12. This impact is therefore considered significant and unavoidable.~~

The following citation has been added to Chapter 3L:

> O'Conner, Lynn. Transportation planner. California Department of Transportation, District 10. November 3, 2000—phone conversation regarding State Route 12 widening project. October 25, 2000—preliminary design maps for the State Route 12 widening project.

B8-3. Impacts of the Delta Wetlands Project alternatives on SR 12 are described on pages 3E-6, 3E-13, and 3E-14 of the 1995 DEIR/EIS (pages 3E-7, 3E-14, and 3E-15; respectively of FEIS Volume 1) under "Bouldin Island". Implementation of the Delta Wetlands Project would not significantly affect ongoing roadway maintenance and planned future widening. See response to Comment B8-1 above.

B8-4. Impacts of the project on SR 12 are described on page 3E-6 of the 1995 DEIR/EIS (page 3E-7 of FEIS Volume 1) under "Bouldin Island". The Delta Wetlands Project would change the land uses adjacent to the highway ROW from agricultural to open space/habitat areas; however, it would not be inconsistent with future planned widening and would not involve construction of permanent structures that would make additional roadway widening infeasible. If SR 12 improvements are proposed, the lead agencies for the improvements would assess their impacts on the habitat island in CEQA documents required for the highway widening project.

B8-5. See responses to Comments B8-1 and B8-4 above.

B8-6. See response to Comment B8-2.

B8-7. Caltrans recently transmitted preliminary design information for the SR 12 widening project on Bouldin Island to Jones & Stokes (O'Conner pers. comm.). This information indicates that approximately 100 feet of land south of the existing highway ROW would have to be acquired to widen the highway. In December 1995, the HMP team met with Caltrans representatives to consider changes to the planned habitat configurations on Bouldin Island in response to this comment letter. No formal agreement was reached at that time. If the habitat configurations shown in the HMP are revised to accommodate highway widening on Bouldin Island, Delta Wetlands would submit those changes to the Habitat Management Advisory Committee (HMAC) for review and approval.

B8-8. Appendix G3 of the 1995 DEIR/EIS describes the HMP for Bouldin Island. The HMP team designed island habitats, habitat juxtaposition, and habitat management criteria to meet the management goals of the HMP. The HMP included in the 1995 DEIR/EIS is at an appropriate level of detail for assessment of the environmental impacts of the Delta Wetlands Project under NEPA, CEQA, and the California and federal ESAs. The construction implementation plan for the HMP would include detailed construction specifications and plan drawings; it would be developed by Delta Wetlands and reviewed by the SWRCB, USACE, and DFG (see page 13 of the HMP). Discussions with other interested parties, including Caltrans, regarding the design specifications, detailed plans,

and maintenance practices would take place during detailed planning; they are not required as part of the NEPA and CEQA process.

B8-9. See responses to Comments B8-1 and B8-7.

B8-10. As described in response to Comment B8-8, the HMP included in the 1995 DEIR/EIS is at an appropriate level of detail for assessment of the environmental impacts of the Delta Wetlands Project under NEPA, CEQA, and the California and federal ESAs. The construction implementation plan for the HMP would include detailed construction specifications and plan drawings; it would be developed by Delta Wetlands and reviewed by the SWRCB, USACE, and DFG (see page 13 of the HMP). The agreement referenced in this comment, which would govern maintenance of the water system, ditches, and berms, would be discussed during detailed planning; it is not required as part of the NEPA and CEQA process.

B8-11. The amount of water on Bouldin Island under Alternatives 1 and 2 would be within the existing parameters of the amount of water used on the island for agricultural production. Generally, the duration of flooding would increase and the depth of the water would be more uniform across the island under habitat management than under agricultural use. The commenter is correct in stating that water would not be stored at elevations higher than present elevations and would not be retained any closer to the highway than under existing conditions.

Detailed descriptions of water elevations and water management for each habitat type to be created on the habitat islands are presented in Table 2 of the HMP (Appendix G3). Water depths on flooded seasonal wetland and agricultural habitats (76% of Bouldin Island area) would range from 0 to 12 inches, which is within the range of water depths applied to croplands for weed control under existing conditions. The period of inundation of flooded habitats that would be created with project implementation, however, would exceed existing flooding practice by several months.

Emergent marsh, permanent lake, borrow ponds, and canals (7% of the Bouldin Island area) would maintain water throughout the year at depths greater than 12 inches. Permanent lakes and borrow ponds would be located several thousand feet south of SR 12 (see HMP Figure 2). The existing canal network would be maintained with implementation of the HMP. Water depths in emergent marshes would not exceed 36 inches.

B8-12. The biological opinions and protest dismissal agreements, which were developed subsequent to the publication of the 1995 DEIR/EIS, apply to the proposed project (Alternatives 1 and 2). It is therefore unlikely that Alternative 3 would be approved and permitted. If Alternative 3 were approved, as described in Mitigation Measure E-8 on page 3E-14 of the 1995 DEIR/EIS (page 3E-15 of FEIS Volume 1), all design and construction plans for Wilkerson Dam under Alternative 3 would be coordinated with the California Department of Transportation (Caltrans) and DSOD. The final levee design

would include details about the spillway and drainage ditch along SR 12 and would be reviewed by Caltrans before project construction. The potential effects on SR 12 of implementing Alternative 3 are described broadly under Impact E-14, "Increase in the Risk of Structural Failure of SR 12". Caltrans' concerns regarding mud heave, unusual soil conditions, construction loading, seepage, and groundwater and surface water levels would be addressed during the design phase coordinated with Caltrans engineers.

B8-13. Chapter 3L of the 1995 DEIR/EIS and of Volume 1 of this FEIS includes a description of the roadway network on Bouldin Island. SR 12 is the only public road on the island, but several narrow private roads provide access to agricultural operations on the island.

The existing private roads on Bouldin Island may provide adequate access to the proposed project facilities, including private recreation facilities. However, it is recognized that if a new public access road connector were proposed, an encroachment permit for construction of public access from SR 12 would be required.

B8-14. Chapter 3I, "Land Use and Agriculture", identifies the change in land use from agricultural use to open space on Bouldin Island under Alternatives 1 and 2. As described in response to Comment B8-1, the Delta Wetlands Project would change the land uses adjacent to the highway ROW from agricultural to open space/habitat areas, but would not be inconsistent with future planned widening or involve construction of permanent structures that would make additional roadway widening infeasible. Therefore, implementation of the Delta Wetlands Project would not affect ongoing roadway maintenance and planned future widening.

B8-15. Figure 4 in the HMP (Appendix G3) shows the location of spaced-blind, free-roam, and closed hunting zones. The free-roam hunting zone is shown as extending to the SR 12 ROW. Hunters may roam throughout the area for purposes of hunting but are required to comply with all federal, state, and local laws and regulations that govern hunting activities, including compliance with the county ordinances that restrict discharge of firearms from public roadways.

B8-16. The locations of existing wetlands and other habitats are presented in Figures 3G-5 through 3G-9 in the 1995 DEIR/EIS and of Volume 1 of this FEIS . After these habitat maps were prepared, USACE and the Natural Resources Conservation Service (NRCS) revised the jurisdictional delineation for the Delta Wetlands Project islands. However, USACE deemed the habitat maps included in Chapter 3G sufficient to represent the jurisdictional waters of the United States. Maps showing the type, extent, and locations of Section 404 jurisdictional wetlands are on file and available for review from USACE's Sacramento District and the NRCS's state office in Sacramento. Delta Wetlands is currently working with USACE and Jones & Stokes to update the delineation to reflect current conditions on the project islands. See Chapter 3G, "Affected Environment and Environmental Consequences - Vegetation and Wetlands", of Volume 1 of this FEIS for more information.

B8-17. Caltrans will continue to receive information during the environmental review process, the water right decision, permit compliance, and project construction as they relate to Caltrans' jurisdiction over SR 12 on Bouldin Island.

Letter B9

To : <jmonroe@usace.mil>
Cc :
Bcc :
From : ngayou@water.ca.gov (Nadell Gayou)
Subject : Public Notice 190109804, Delta Wetlands
Date : Thursday, December 21, 1995 at 3:07:44 pm PST
Attach :
Certify : N
Encrypt : N

Jim Monroe:

I am making a guess on your E-mail address, please let me know if you receive this.

Nadell Gayou

Received by email on 12/21/95 J.M.

December 21, 1995

Colonel John N. Reese
U. S. Army Corps of Engineers
Regulatory Section
1325 J Street
Sacramento, CA 95814-2922

Public Notice 190109804 (State Water Resources Control Board)
Delta Wetlands, San Joaquin and Contra Costa Counties

Dear Colonel Reese:

The State has reviewed the subject public notice, coordinating its review with the agencies listed below.

The State Lands Commission states that a permit will be required for "structures located on the waterward side of the levees within a natural channel". For further information contact Diane Jones at (916) 574-1843. **B9-1**

Thank you for providing an opportunity to review this project.

Sincerely,

James T. Burroughs
Deputy Secretary and General Counsel

cc: Department of Boating and Waterways
Department of Fish and Game
Department of Parks and Recreation
Reclamation Board
Central Valley Regional Water Quality Control Board
State Lands Commission

California Resources Agency

B9-1. The lead agencies have received individual comment letters from the California Department of Boating and Waterways (comment letter B2), DFG (comment letter B6), and the SLC (comment letter B5). See responses to the comments from those resource agencies. Additionally, the permits required by the SLC are identified in Table 4-1, "Permits and Approvals That May be Required for the Delta Wetlands Project Alternatives", of the 1995 DEIR/EIS and of FEIS Volume 1.

Section C. Local Agencies

MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Office of the General Manager

November 3, 1995

Mr. Jim Sutton
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, California 95812-2000

Dear Mr. Sutton:

Draft Environmental Impact Report/Environmental Impact Statement For the Delta Wetlands Project

We have received the Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Delta Wetlands Project in the Bay-Delta estuary. The proposed project involves the diversion and storage of water onto two Delta islands, and the seasonal diversion and use of water for wetlands and wildlife habitat management on two other Delta islands. The public review period for the proposed project closes on November 21, 1995.

The Metropolitan Water District of Southern California (Metropolitan) has an entitlement to 2.0115 million acre-feet of water from the State Water Project, which diverts water from the Delta. Since the proposed project would also divert water from the Delta, Metropolitan is interested in thoroughly reviewing the pertinent issues in the Draft EIR/EIS. Metropolitan is supportive of planning efforts such as for the proposed project that are designed to meet California's growing water needs in an environmentally sound manner. So that we may provide you with constructive comments, Metropolitan requests an extension of 45 days from the November 21 comment deadline due to the significance of the proposed project and the amount of information contained in the Draft EIR/EIS. C1-1

We appreciate the opportunity to provide input to your planning process. Please call me at (213) 217-6242 at your earliest convenience to discuss the extension.

Very truly yours,

Laura J. Simonek
Senior Environmental Specialist

MME:bvf

350 South Grand Avenue, Los Angeles, California 90071 • Mailing address: Box 54153, Los Angeles, California 90054-0153 • Telephone (213) 217-6000

Metropolitan Water District of Southern California

C1-1. The SWRCB and USACE extended the comment period by 30 days (to December 21, 1995) in response to this and other requests.

SAN JOAQUIN COUNTY
COMMUNITY DEVELOPMENT DEPARTMENT

1810 E. HAZELTON AVE., STOCKTON, CA 95205-6232
PHONE: 209/468-3121 Fax: 209/468-3163

November 14, 1995

State Water Resources Control Board
Division of Water Rights
Attn: Jim Sutton
P.O.Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers
Regulatory Branch
Attn: Jim Monroe
1325 J Street, Room 1444
Sacramento, CA 95814-2922

Re: Draft EIR/EIS for the Delta Wetlands Project

The Delta Wetlands Project directly involves two islands in San Joaquin County. Bacon Island would serve as a "reservoir island," and Bouldin Island would be a "habitat island." Private recreation facilities are proposed for both of the islands.

Both Bacon and Bouldin Islands are zoned for General Agriculture. The zoning regulations of San Joaquin County do not address the creation of reservoirs or habitat; however, private recreation facilities, such as marinas, require a Use Permit.

The project information provided in the environmental document does not include enough specifics for the County to determine if additional environmental information is needed to adequately assess the impacts of the recreation facilities. Therefore, any applications filed with the County for recreation facilities will require separate environmental determinations, based on the precise locations, access, and plans for the facilities. The proposed airstrip on Bouldin Island will also require a Use Permit and further environmental assessment. C2-1

The DEIR/EIS states that only residents, employees, and relatives fish from the levees along Bacon Island. This is probably incorrect. The east side of the island is one of the few areas in the County where a public road provides access to a Delta waterway. In past surveys we have found that the area is used for bank fishing by the general public. The DEIR should consider the provision of some bank fishing areas for the public. Bank fishing C2-2

has been one of the most popular recreation activities in the County. C2-2

With respect to traffic generation, the County General Plan calls for no more than an LOS of C on all County roadways in the Delta, with an LOS of D on State highways. Page 3L-7 is incorrect in inferring that all County roadways have a planned LOS of D. It is true that roads in the Congestion Management Program (CMP) may be D, but in the Delta the only roads in the CMP are State highways. C2-3

The DEIR does not adequately address protective services, with respect to the increased traffic that would be generated by the project and the need of police and fire units to respond to accidents. C2-4

The DEIR states that the No-Project Alternative would result in intensified agricultural operations, with an increase in the rate of subsidence. It would seem that if intensification of agriculture were a possibility, it would already have occurred. C2-5

Thank you for the opportunity to comment on the DEIR/EIS.

Sincerely,

Peggy Keranen

Peggy Keranen
Deputy Director

c. Manuel Lopez, Public Works
John Pulver, Public Works
Richard Laiblin, CAO
6.6.03.12

San Joaquin County Community Development Department

C2-1. The design details, square footage, and berth lengths given in the 1995 DEIR/EIS and shown in Figures 2-7 and 2-8 of Appendix 2 are preliminary and are used for analysis of the facilities in the document. The analysis assumes a maximum facility size; actual facility design will not exceed the assumptions in the NEPA and CEQA analysis. If, when specific design details are submitted, a regulating agency determines that the NEPA and CEQA documentation already completed for the project does not cover site-specific environmental impacts in enough detail, the agency may require additional environmental documentation before approving permits or entitlements.

The airstrip on Bouldin Island is an existing facility; therefore, no new county permits should be required.

The description of minor use permits under San Joaquin County in Table 4-1 of Chapter 4 of the 1995 DEIR/EIS has been deleted and replaced with the following:

Agency and Requirements	Agency Authority	Project Activities Subject to Requirements
Use Permit	The county issues permits for construction of recreation facilities and for the opening of a new airport or the modification of an existing airport.	Construction of recreation facilities and the operational activities of the airport on Bouldin Island that include agricultural, recreational, and private commercial activities

C2-2. As described on page 3E-2 of the 1995 DEIR/EIS (page 3E-2 of Chapter 3E of FEIS Volume 1), Bacon Island Road is a county road that runs along the eastern perimeter levee on Bacon Island (Figure 3E-1). San Joaquin County has a 40-foot-wide right-of-way along the road. Although members of the public fish from the levee adjacent to the road, there are no designated public access areas to Delta waterways along the road or to the rest of the island. Bacon Island Road would remain a county road under Alternatives 1, 2, and 3 (Forkel pers. comm.). Therefore, the conditions under which bank fishing now occurs on Bacon Island would not change.

The 1995 DEIR/EIS incorrectly states on page 3J-3 that fishing along the Bacon Island Road perimeter levee is limited to relatives and employees of property owners. The text has been changed to indicate that the public also participates in fishing along the Bacon Island Road levee although there are no designated public access areas off the county roadway. A longtime farm operator on Bacon Island was consulted to verify this information. The text in the "Fishing and Boating" section under "Bacon Island" has been revised as follows (see page 3J-4 of the FEIS Volume 1):

Approximately 90% of the fishing on Bacon Island takes place adjacent to the county road, which is the only means of public access. ~~Approximately 65% of the anglers fish from levees and 35% use boats. Fishing from the levees is limited to relatives and employees of property owners. Anglers originate primarily from San Joaquin County and the East Bay.~~ Although there are no designated public access areas along the roadway for fishing, members of the public fish Middle River from the island perimeter levee adjacent to Bacon Island Road. No other areas of Bacon Island are accessible to the public. Therefore, fishing from other parts of the island (i.e., away from the county roadway) is limited to relatives and employees of property owners, and trespassers in those areas are asked to leave. (Shimasaki pers. comm.)

~~On average over the year,~~ Between the middle of November and the latter part of January, approximately 20 anglers per day fish on weekends and ~~about~~ between two and four per day fish on weekdays from the levee adjacent to Bacon Island Road. These numbers are generally lower during the rest of the year. Total fishing activity is estimated at 3,120 recreation use-days per year on Bacon Island (Table 3J-2). ~~Boats do not originate from or dock on the island.~~ Anglers using Bacon Island originate primarily from San Joaquin County and the East Bay. Although there are no marinas or boat docks on Bacon Island, about 35% of the anglers use boats to gain access to Delta waterways adjacent to Bacon Island. The remaining anglers (approximately 65%) fish from the levee adjacent to the county road. (Shimasaki pers. comm.)

The following citation has been added to Chapter 3J:

Shimasaki, Kyser. Consultant to Kyser Farms, Bacon Island, CA. February 15 and 16, 1996—telephone conversations with Jeanine Hinde of Jones & Stokes.

See also response to Comment B6-21 regarding the provision of public recreation on the Delta Wetlands Project islands.

C2-3. Chapter 3L of the 1995 DEIR/EIS has been changed to correctly reflect the San Joaquin County General Plan LOS criterion as described in the comment. The discussion of San Joaquin County's LOS criterion for determining impact significance under "Traffic Congestion" has been revised as follows (see FEIS page 3L-8):

According to the San Joaquin County ~~Congestion Management~~ General Plan, an LOS of E or F is an unacceptable LOS on all ~~roadways~~ state highways in the Delta portion of San Joaquin County ~~(Chalk pers. comm.)~~. Furthermore, an LOS of D, E, or F is unacceptable on all other San Joaquin County roadways in the Delta (San Joaquin County Community Development Department 1992).

The following citation has been added to Chapter 3L:

San Joaquin County. Community Development Department. 1992. San Joaquin County general plan 2010. July 29, 1992. Stockton, CA.

C2-4. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

C2-5. The No-Project Alternative is based on the assumption that intensified agricultural conditions represent the most realistic scenario for the Delta Wetlands Project islands if permit applications are denied. The lead agencies developed the description of the No-Project Alternative based on the stipulation that no discretionary actions, as defined by NEPA and CEQA, would be needed. Accordingly, Delta Wetlands was involved in determining those practicable future actions that likely would be implemented on the Delta Wetlands Project islands without federal or state permits. Implementation of more intensive agricultural uses, such as orchards, on the Delta Wetlands islands requires a long-term commitment of capital and real estate. Delta Wetlands would pursue such opportunities only if the pending applications for the Delta Wetlands Project were not approved.

SHASTA COUNTY
BOARD OF SUPERVISORS

1815 Yuba Street, Suite 1
Redding, CA 96001
(916)225-5557
(800)479-8009
(916)225-5189-FAX

MOLLY WILSON, DISTRICT 4

November 27, 1995

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1325 J Street, 14th Floor
Sacramento, CA 95814-2922

Dear Mr. Monroe:

I have reviewed the Executive Summary for the Draft Environmental Impact Report and Environmental Impact for the Delta Wetlands Project as prepared by Jones & Stokes Associates, Inc. of Sacramento, California.

I have, for a number of years, been involved in water related issues, and have served as the County's representative to various water boards, commissions, and organizations. I fully support the purpose of the proposed Delta Wetlands project. The diversion and storage of surplus inflows, transferred water, or banked water for later sale or release has the potential for positive impacts on northstate water resources. As an "area of origin" we are very concerned that all efforts are made by downstream users to reduce the demands on northstate supplies. **C3-1**

Likewise, the provisions for managed wetlands and wildlife habitat areas and recreational uses are seen as a very positive aspect of the project. It is only through effective management of our precious resources and habitat that we will be able to guarantee that they will be available for use and enjoyment by future generations in all parts of the State of California.

Thank you for the opportunity to comment on the Draft E.I.R./E.I.S. for the Delta Wetlands Project.

Sincerely,

Molly Wilson

MOLLY WILSON
District 4 Supervisor

Shasta County Board of Supervisors

C3-1. The lead agencies acknowledge this comment supporting the project. Because this letter does not specifically comment on the environmental analysis in the 1995 DEIR/EIS, no response is required.

SAN JOAQUIN TRIBUTARIES ASSOCIATION
Merced Irrigation District
Modesto Irrigation District
Oakdale Irrigation District
South San Joaquin Irrigation District
Turlock Irrigation District

P.O. Box 4060
Modesto, CA 95352

December 6, 1995

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1325 J Street, Room 1444
Sacramento, CA 95814-2922

Gentlemen:

This letter is to express the concern of the San Joaquin Tributaries Association (SJTA) members regarding the proposed Delta Wetlands Project and how that project may impact the survival of San Joaquin salmon. We have reviewed the pertinent parts of the Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS) for the Delta Wetlands Project and do not believe the document adequately addresses our concern. C4-1

SJTA members have spent millions of dollars over the past ten years working towards improving the fall run Chinook salmon fishery on the Tuolumne River specifically and in the San Joaquin Basin in general. In addition, the Districts are supporting efforts by both the U.S. Fish and Wildlife Service and the California Department of Fish and Game to double San Joaquin Basin Chinook salmon production. The SJTA members are also actively working with other interested agencies in promoting the installation of a permenant operable Old River Barrier to minimize the impact of the existing Central Valley Project and State Water Project export pumps on San Joaquin Basin salmon. Therefore, we have a real interest in seeing that our efforts are not ruined by the construction of additional Delta pumping plants that will be allowed to either intercept, damage or kill outmigrating San Joaquin Basin salmon smolts on their way to the ocean.

The Draft EIR/EIS clearly concludes that the project diversions could result in significant salinity increases and significant elevations of dissolved organic carbon concentrations; and that project discharges could result in significant changes in other water quality variables in Delta channel receiving waters. The Draft EIR/EIS then states that through adjustments to diversions and discharges impacts can be reduced to less-than-significant levels. However, there are no indications or assurances as to how these adjustments in project operations will be decided or made, and thus no assurance that such mitigation will occur. At the very least, the EIR/EIS should set forth those measures that must be implemented in order to reduce the identified impacts to levels of insignificance. C4-2

Specifically, in regard to the fishery issues, the Draft EIR/EIS concludes that the there are significant potential impacts to fishery resources from the San Joaquin Basin in that discharge of water could increase channel water temperature and reduce juvenile chinook salmon survival; and that project operations could affect flows during the peak out-migration period of Mokelumne and San Joaquin River chinook salmon, indirectly increasing chinook salmon mortality. The Draft EIR/EIS then states that proposed integration of monitoring of fish populations and flow conditions with operations criteria for diversion and discharge would reduce Delta Wetlands project effects related to entrainment and transport to less-than-significant levels; and that the use of efficient fish screens, in combination with the proposed operations criteria, would reduce entrainment loss effects to less-than-significant levels. Again, there is no discussion as to how these adjustments in project operations will be decided or made nor are there an assurances that all diversions to the Delta Wetlands Islands will have adequate fish screens installed. Again, the EIR/EIS should set forth those measures that must be implemented to reduce the identified impacts to levels of insignificance C4-3

In addition, the SJTA requests that the State Water Resources Control Board and/or the U.S. Corps of Engineers include in any license or permit issued to the Delta Wetlands Project conditions that prohibit either: 1) Pumping of water from the Delta, which will divert salmon smolts onto the Delta islands or 2) Discharge of water to the Delta, which will increase the temperature of the Delta water above the tolerances of the salmon smolts, at any time outmigrating San Joaquin Basin Chinook salmon smolts are moving through the Delta (generally during April and May of each year).

If you have any questions about our concerns please do not hesitate to contact either William Johnston at MID (209-526-7384) or Robert Nees at TID (209-883-8214).

Sincerely,

Ross Rogers, General Manager
Merced Irrigation District

Allen Short, General Manager
Modesto Irrigation District

Barrett Kehl, General Manager
Oakdale Irrigation District

Rick Martin, General Manager
South San Joaquin Irrigation District

Paul D. Elias, General Manager
Turlock Irrigation District

xc: Jones and Stokes Associates, Inc.
Attention: Fern Weston
2600 V Street
Sacramento, CA 95818-1914

San Joaquin Tributaries Association

C4-1. The potential effects of Delta Wetlands Project operations on juvenile fall-run chinook salmon migrating from the San Joaquin River were identified as a significant impact (Impact F-4) in Chapter 3F, "Fishery Resources", of the 1995 DEIR/EIS. The 1995 DEIR/EIS recommended mitigation to reduce the impact to a less-than-significant level. Since this comment letter was submitted, the lead agencies have concluded formal consultation with DFG, NMFS, and USFWS, and these agencies have all issued no-jeopardy biological opinions on potential project effects on listed fish species. As part of the consultation process, USACE, the SWRCB, NMFS, USFWS, DFG, and Delta Wetlands agreed on the project operating parameters referred to as the FOC, which have been incorporated into the proposed project. The FOC terms and RPMs described in the biological opinions provide for greater protection for both listed and nonlisted fish species and their habitats; they replace the mitigation proposed in the 1995 DEIR/EIS. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for details about the formal consultation and discussion of the terms of the biological opinions.

C4-2. The SWRCB and USACE would incorporate all feasible measures and adjustments in Delta Wetlands Project operations that avoid and minimize adverse effects on water quality (e.g., salinity and DOC) into terms and conditions of the project permits. The recommended mitigation measures, described in the 1995 DEIR/EIS, have been further developed through the state and federal ESA consultation process, resulting in the FOC and biological opinion RPMs.

Chapter 4 of the 2000 REIR/EIS (see Chapter 3C of FEIS Volume 1) describes how the proposed mitigation of DOC increases would be implemented to control the effects of the Delta Wetlands Project on export DOC concentrations under extreme (worst-case) DOC loading conditions. It also discusses how the mitigation would be adjusted to meet any mitigation requirement specified in the terms of the project's water right permits. The WQMP negotiated by Delta Wetlands and CUWA provides additional details on monitoring, modeling, and operational controls that would serve to avoid and minimize adverse effects on water quality.

C4-3. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for details about the FOC terms and RPMs that pertain to effects related to temperature and diversions, to the required monitoring program, and to fish screens. See also response to Comment B6-60 regarding requirements for fish screens.

Letter C5

REGIONAL PARKS

EAST BAY REGIONAL PARK DISTRICT

December 12, 1995

BOARD OF DIRECTORS
Ted Radke
President
Susan Smartt
Vice-President
Douglas Siden
Treasurer
Jean Siri
Secretary
Carol Severin
Jocelyn Combs
Beverly Lane
Pat O'Brien
General Manager

Mr. James Sutton
State Division of Water Rights
SWRCB Third Floor
901 "P" Street
Sacramento, CA 95812

Subject: Delta Wetlands Project

Dear Mr. Sutton:

The East Bay Regional Park District (EBRPD) has reviewed the subject project with respect to its impact upon regional recreation opportunities. The EBRPD Master Plan calls for increased public recreation access to the Delta within the District's jurisdiction (Contra Costa and Alameda Counties). The EBRPD notes that the project provides only for private recreation access facilities and strongly advocates changes to the project that would provide public access to the Delta for such activities as hiking and bicycle trails, fishing, boating, birdwatching, education and interpretive programs, etc. As a public agency, the District believes that public access on a non-fee or limited fee-for-service basis should be provided as well as commercial recreation by private providers. These kinds of recreation opportunities are rare in the area, should be increased, and the District would be willing to cooperate in providing them. C5-1

Thank you for the opportunity to comment.

Very truly yours,

Martin Vitz
Advanced Planning Manager

MV/tl

cc: Robert E. Doyle, EBRPD
Margit Aramburu, Delta Protection Commission
Robert Hight, State Lands Commission
Supervisor Tom Torlakson, Contra Costa County

C:\WPFILES\MARTIN\SUTTON.LTR

2950 Peralta Oaks Court P.O. Box 5381 Oakland, CA 94605 0381 Tel: 510 635 0135 TDD: 510 633 0460 Fax: 510 569 4319

East Bay Regional Park District

C5-1. Implementing the Delta Wetlands Project would not reduce public access or opportunities for recreation on the Delta Wetlands Project islands. See response to Comment B6-21 regarding the provision of public recreation on the Delta Wetlands Project islands.

EAST BAY
MUNICIPAL UTILITY DISTRICT

WATER PLANNING DEPARTMENT
JOHN B. LAMPE
DIRECTOR

December 14, 1995

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1325 J Street, Room 1444
Sacramento, CA 95814-2922

SUBJECT: DRAFT EIR/EIS FOR THE DELTA WETLANDS PROJECT

Dear Mr. Sutton and Mr. Monroe;

We appreciate the opportunity for the East Bay Municipal Utility District (District or EBMUD) to review the draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Delta Wetlands (DW) Project. The following are the comments from the District:

Mokelumne Aqueducts Safety The safety of the Mokelumne Aqueducts on Woodward Island and Orwood Tract are of great importance to the District because the aqueducts are the critical water supply lines to the East Bay. The draft EIR/EIS mentioned that DW has been collecting baseline groundwater data on islands adjacent to the DW islands since 1989 and will implement certain seepage monitoring and control measures in conjunction with the operation of the project (Pages 3D-4 & 3D-8 to 10). The background piezometers indicated in Figure 3D-3 are far apart and none of them are near to the Mokelumne Aqueducts on Woodward Island or Orwood Tract, the data collected from these piezometers are not sufficient to be used as a basis to assess the impacts on the aqueducts due to the implementation of the DW project. Also, there is not enough information in the draft EIR/EIS to determine that the Seepage Performance Standards and the monitoring system and monitoring protocol are adequate to protect the safety of the Mokelumne Aqueducts. EBMUD does not agree with DW's conclusion that Impact D-2: Potential for Seepage from Reservoir Islands to Adjacent Islands, is less than significant. C6-1

DW needs to demonstrate, to the satisfaction of EBMUD with supporting information, the adequacy of : C6-2

- o the derivation of the Seepage Performance Standards;

375 ELEVENTH STREET . OAKLAND . CA 94607-4240 . (510) 287-1127 . FAX (510) 287-1275
P.O. BOX 24055 . OAKLAND . CA 94623-1055
BOARD OF DIRECTORS JOHN A. COLEMAN . KATY FOULKES . JOHN M. GIOIA
FRANK MELLON . NANCY J. NADEL . MARY SELKIRK . KENNETH H. SIMMONS

Recycled Paper

- the philosophy and technical details of the seepage control and monitoring system with regard to its design and operation, including, but not limited to, geological conditions, locations and depths of piezometers, frequency of monitoring, etc.

- the protocol for dissemination of information and for coordination of efforts to implement remedial measures should the monitoring results exceed the acceptable standards. As a minimum DW should be required to submit this information to the SWRCB, and other interested parties (such as EBMUD), as part of its Annual Progress Report by Permittee. C6-2 cont'd

With respect to the erosion of the Delta levees (particularly those on Woodward Island and Orwood Tract) in connection with DW's operations, DW considers that the impact is less than significant (Impacts B-2 & D-4). However, failure of DW's levees would present considerable risks to the water supply to EBMUD's 1.2 million consumers. Consequently, mitigation measures should be added to require monitoring of actual operation to ensure that the installed facilities do operate as designed, and DW should be required to take immediate remedial action if erosion of the levees or the channel bottom is observed. C6-3

Improvement to Delta Levees to be approved by DSOD In the draft EIR/EIS, it was mentioned that the design of the interior levee along the southern side of State Route 12 must be approved by the Division of Safety of Dams (DSOD)(Page 3E-13) ,whereas for the improvements to other levees for the storage of water, no explicit reference to DSOD's approval has been mentioned (Page 3D-7). All levees on islands used to store water to an elevation higher than 4 feet above mean sea level are classified as dams and are subject to the requirements of DSOD. Approval by DSOD should be included as a mitigating measure. C6-4

Entrainment and Entrapment of Mokelumne River Salmon The mitigation measures for Impact F-4: Potential Increase in the Mortality of Chinook Salmon Resulting from the Indirect Effects of DW Project Diversions and Discharges on Flows, includes a restriction against diverting water to fill the reservoir islands during April, May, and June (the Fixed Measures), as well as other Adaptive Measures to be developed. EBMUD's monitoring data indicate that salmon fry start to move down the river as early as February. To reduce the entrainment and entrapment losses of the Mokelumne salmon fry and smolts, the Fixed Measures, as described in Mitigation F-3, should consider mitigating the possible losses of Mokelumne salmon fry and smolts migrating during the period of February through June. Also EBMUD should be included in the development of the Adaptive Measures for the protection of the Mokelumne fishery. C6-5

Notwithstanding the proposed mitigations, the siphon intake on Webb Tract is located immediately opposite the estuary of Mokelumne River at the junction with San Joaquin River. An intake at this location imposes significant and obvious impacts on the salmon fry and smolts

coming down the Mokelumne River. This intake should be relocated to the west or the south side of Webb Tract outside San Joaquin River so as to reduce this impact. C6-5 cont'd

DW Diversion could Potentially Affect the Successful Homing of Mokelumne Salmon DW's diversion during the adult salmon upstream migration period in October and November may obliterate the homing capability of the returning Mokelumne salmon. The draft EIR/EIS should consider mitigation this impact. C6-6

Diversion by Delta Wetlands when EBMUD is Making Releases for Public Trust Benefits During times when EBMUD and other upstream senior water rights holders are required to release water for fishery or other Public Trust benefits, DW's diversion, even though such diversions may be consistent with the objectives of the then current Water Quality Control Plan, will nullify, in whole or in part, the benefits created by such releases. DW should include in the draft EIR/EIS means to ensure that the operation of the DW project shall not result in any reduction to the beneficial effects of these releases, and to demonstrate that its operation shall not require, or cause to require, the senior water rights holders to make additional releases to maintain the ecosystem of the Delta. C6-7

American River On page 2-12 in Appendix 2, the statement "However, the current EBMUD Board has decided not to divert water from the American River at this time." is not accurate and should be deleted. In Board Motion 192-95 (copy attached) dated September 12, 1995, the Board directed the staff, among other things, to initiate preliminary design, prepare project-level environmental documentation, and other actions for constructing a pipeline connection between the Folsom South Canal and the Mokelumne Aqueducts for the purpose of delivering water to the customers of EBMUD. C6-8

Computer Modelling DW uses many computer models in the analyses in the draft EIR/EIS. Since EBMUD has no access to the computer models used by DW, EBMUD has to assume that the results of model analyses are representative. However, this does not imply that EBMUD endorses or accepts that these computer models are adequate and relevant. C6-9

If you have any question, please contact Jon Myers (510-287-1121), or John Leung (510-287-1148).

Sincerely,

John B. Lampe
Director of Water Planning
JBL:JKL:jkl
W:\JKL\DWETLND2
Attachment

cc: John Winther
Delta Wetlands
3697 Mt. Diablo Boulevard, Suite 320
Lafayette, CA 94549

Byron Buck
CUWA
455 Capitol Mall, #705
Sacramento, CA 95814

Richard A. Denton
CCWD
PO Box H2O
Concord, CA 94524

ACTION SUMMARY
REGULAR MEETING OF THE BOARD OF DIRECTORS
September 12, 1995

Agenda Item	Motion	Action
1.	180-95	Approved the Minutes of the regular meeting of August 8, 1995 and the special meetings of July 18 and August 14, 1995.
3.	181-95	Filed the report of the fund balance and activity for the System Capacity Charge Fund, the Water Conservation and Development Fund, and the Wastewater System Equipment Replacement Fund for FY95 issued August 28, 1995.
4.	182-95	Contract awarded to Corporate Express of the West, Inc. at an estimated annual amount of $380,000 per year for supplying and delivering office supplies beginning October 1, 1995 through September 30, 1998 for a three-year period under Proposal No. 9522.
6.	183-95	Authorized a sole source agreement with BancTec Service Corporation in the amount of $125,000, for a 33-month period to maintain the bill payment center's terminals, computers and customized software beginning October 1, 1995 and ending June 30, 1998.
7.	184-95	Authorized contracts with Cellular One and GTE Mobilnet at a total estimated cost of $660,000 for cellular telephone services for a three-year period from October 1, 1995 through September 30, 1998.
9.	185-95	Contract awarded to Metrocall at a total estimated cost of $135,000 for District-wide pager services for a three-year period commencing October 1, 1995.
10.	186-95	Renewed contracts with ACT 1 Personnel Services and Diversified Personnel Services, Inc. at a combined amount of $144,086 to provide temporary clerical assistance for a one-year period from July 1, 1995 through June 30, 1996.
12.	187-95	Authorized the purchase of copper tubing at an estimated cost of $150,000 on the open market for the period of October 1, 1995 through September 30, 1996.
13.	188-95	Authorized Amendment No. 2 to the agreement with the Mark Group, Inc. to increase the ceiling to $375,000 for additional work preparing the Trench Spoils Management Plan.

Agenda Item	Motion	Action
14.	189-95	Authorized the continued employment of Liebert, Cassidy & Frierson as special counsel for an amount not to exceed $125,000.
2.	190-95	Filed correspondence with the Board of Directors.
8.	191-95	Directed staff to enter into negoations with Geotopo, Inc., Oakland, CA for consulting services to develop a Geographic Information Systems Strategic Plan.
20.	192-95	Directed staff to undertake the following actions consistent with the Staff Report for the Board of Directors Workshop on the EBMUD Water Supply Management Program Action Plan, held on September 12, 1995: • Initiate preliminary design, prepare project-level environmental documentation and initiate applicable permit processes and USBR contract modifications for a pipeline connection between the Folsom South Canal and the Mokelumne Aqueducts for the purpose of delivering water to the customers of EBMUD as a stand-alone project not dependent upon any additional water supply project components; • Continue negotiations with San Joaquin County interests regarding a joint EBMUD/San Joaquin County conjunctive use project to provide additional storage to meet EBMUD's need for additional water; • Initiate discussions with Sacramento-area interests regarding a potential joint EBMUD/Sacramento-area conjunctive use project to provide additional storage to meet EBMUD's need for additional water, including negotiations with Sacreamento Area Water Forum and San Joaquin County interests on a multi-regional water solution that can be implemented in the near-term, based on a "Freeport South" alternative that does not include an extension of the Folsom South Canal; • Intiate project-level studies for raising Pardee Dam to provide additional storage to meet EBMUD's need for additional water, while simultaneously evaulating Middle Bar and Duck Creek Reservoirs as possible alternatives to raising Pardee, and make further recommendations as to the best reservoir option by December 1995.

Agenda Item	Motion	Action
22.	193-95	Approved the following revisions to the District's Residential Backflow Program: • District will reimburse up to $400 each for all customers who registered their wells and absorbed on-going administrative costs; • Customers with wells pay for annual testing ($45 to $75 per year depending on site differences); and • All well owners identified in the future to pay costs for installation and annual testing.
21.	194-95	Approved the following for construction services for the Adeline Maintenance Center Project: 21.1 Contract awarded to Walsh-Pacific Construction-Schedule II in an amount of $25,417,000 for Design/Build Project Construction under Specification No. 1687. 21.2 Authorized agreement with Consolidated CM in an amount not to exceed $500,000 to provide construction management/ inspection support services. 21.3 Amended agreement with AGS, Inc. in an amount not to exceed $30,000 to provide geotechnical support services for construction.

Agenda Item	Resolution	Action
11.	32935-95	Authorizing sale of surplus property (Altura Reservoir site) to Robert and Alma Lasher.
15.	32936-95	Confirming appointment of Dennis M. Diemer as Interim General Manager. The effective date is September 16, 1995.
16.	32937-95	Appointing Dennis M. Diemer to Retirement Board.

Lynelle M. Lewis

Lynelle M. Lewis, Secretary
September 13, 1995

East Bay Municipal Utility District

C6-1. The commenter is referring to information or analysis in the 1995 DEIR/EIS that was replaced or augmented by the 2000 REIR/EIS. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents a new analysis of the potential seepage impacts of Delta Wetlands reservoir operations and an evaluation of the effectiveness of the proposed seepage performance standards. Based on this analysis, a new mitigation measure is recommended to improve the proposed seepage control system and reduce potential impacts of the project to a less-than-significant level. Also, the commenter should note that information from both background monitoring wells and seepage monitoring wells (see Figure 3D-3 in Chapter 3D of Volume 1 of this FEIS) would be used to establish baseline groundwater data against which project impacts would be determined. See Chapter 3D of FEIS Volume 1.

Delta Wetlands and EBMUD submitted a protest dismissal agreement to the SWRCB during the water right hearing. Acknowledging the importance of the Mokelumne Aqueduct and the desire to reduce risk to this structure, the agreement directs that Delta Wetlands install more seepage monitoring wells (i.e., reduce the spacing between monitoring wells) where the distance across a waterway from a Bacon Island levee to a neighboring levee is less than 1,200 feet. As a result, more seepage monitoring wells would be installed on Woodward Island. The SWRCB included some of the terms of the protest dismissal agreement in the terms and conditions of the Delta Wetlands water right permit.

C6-2. See response to Comment C6-1 above. As described in the 1995 DEIR/EIS and the 2000 REIR/EIS (see Chapter 3D in Volume 1 of this FEIS), Delta Wetlands would be responsible for implementing remedial measures to control seepage. Delta Wetlands would form a technical review committee to review groundwater monitoring data collected during the operation of the project; this committee would monitor and review the effectiveness of the remedial measures.

The protest dismissal agreement entered into by Delta Wetlands and EBMUD proposes more details regarding the structure and duties of a technical review committee, identified in the agreement as the "Reservoir Island Monitoring and Action Board". Also, according to the Delta Wetlands and EBMUD protest dismissal agreement, Delta Wetlands would make groundwater data publicly available via the Internet or similarly accessible means. As described above, the SWRCB included some of the terms of the protest dismissal agreement in the terms and conditions of the Delta Wetlands water right permit.

C6-3. As described in Chapter 2, "Delta Wetlands Project Alternatives", of the 1995 DEIR/EIS and of FEIS Volume 1, Delta Wetlands would conduct routine inspections and maintenance of the reservoir island levees and siphon and pump stations as part of the proposed project. These inspections would be used to detect any erosion problems that occur as a result of project operation, and remedial actions such as placement of erosion protection material or operational changes would be taken immediately. Additionally,

Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS discusses monitoring and maintenance requirements for the seepage monitoring and control system.

The 2000 REIR/EIS impact analysis includes the recommendations presented in Appendix H for modifying Delta Wetlands' proposed seepage monitoring program and seepage performance standards as a mitigation measure for potential project impacts.

C6-4. The commenter is correct in stating that DSOD would need to approve the design for all levees used to store water to an elevation greater than 4 feet above sea level. See response to Comment B7-6 for more information.

C6-5. In response to the concerns expressed by EBMUD in the 1997 SWRCB hearing on Delta Wetlands' water right applications, the lead agencies directed that Jones & Stokes Associates separately evaluate potential project effects on Mokelumne River chinook salmon. Jones & Stokes Associates' analysis was based on data that EBMUD provided to the lead agencies. The results of the analysis are described in detail in Chapter 5 of the 2000 REIR/EIS (Chapter 3F of FEIS Volume 1). The EBMUD data did not support a conclusion that Delta Wetlands Project operations would significantly affect Mokelumne River juvenile or adult chinook salmon. As described in Chapter 5 of the 2000 REIR/EIS (FEIS Volume 1, Chapter 3F), several FOC terms limit effects of the Delta Wetlands Project on Delta flows during February through June, the period of concern identified by the commenter. As a result, the following terms reduce project effects on outmigrating juvenile chinook salmon:

Delta Wetlands is prohibited from diverting water in April and May.

Diversions are limited during all other months to a percentage of surplus flows and a percentage of outflow, and are also limited to a percentage of San Joaquin River flow during January through March.

Several FOC terms limit indirect effects of Delta Wetlands Project operations on flows in February and March by further limiting diversions during those months based on X2 position, change in X2, March QWEST criteria, and DCC closure.

Delta Wetlands is prohibited from discharging water for export from Webb Tract in January through June.

Additionally, Delta Wetlands is required by the FOC to install fish screens that meet an approach-velocity criterion of 0.2 fps. This combination of measures reduces potential project effects on Mokelumne River juvenile chinook salmon to a less-than-significant level. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for details about these terms.

Despite the protections provided by the FOC, Delta Wetlands and EBMUD negotiated a protest dismissal agreement describing additional measures that Delta Wetlands would take to address EBMUD's concerns about project effects on Mokelumne River salmon. The agreement, submitted to the SWRCB in October 2000, is included in the appendix to this volume. Attachment A of the agreement specifies that Delta Wetlands will implement the following measures to provide further protection against potential project effects on Mokelumne River fisheries:

- Restrict diversions from the northeastern siphon station on Webb Tract to only those times when the southeastern siphon station is operating at full capacity or when certain other conditions are met.

- Remove existing agricultural siphons from Bouldin Island and Webb Tract and limit the total number of siphons on Bouldin and Webb Tract under the proposed project.

- Limit the number of boat docks added to Bouldin Island and Webb Tract.

- Conduct a fisheries monitoring program at Webb Tract.

C6-6. As noted in response to Comment C6-4, the lead agencies directed that the 2000 REIR/EIS include additional analysis of potential Delta Wetlands Project effects on Mokelumne River chinook salmon. The analysis included an evaluation of data on adult migration that EBMUD provided to the lead agencies in 1999. The evaluation of these data did not support a conclusion that adult migration would be affected by project-related changes in the amount of Mokelumne River water present in channels south of the San Joaquin River.

The 2000 REIR/EIS analysis included a worst-case evaluation of project discharges on migration of adult Mokelumne River chinook salmon. The evaluation found that project discharges would have a minimal effect on the proportion of Mokelumne River water moving through the central and south Delta. The analysis concluded that project operations may slightly reduce the proportion of Mokelumne River water present in the central Delta but that such reductions would have a negligible effect on chinook salmon. Furthermore, Delta Wetlands would release water only infrequently in winter. See Chapter 5 of the 2000 REIR/EIS (Chapter 3F of Volume 1 of this FEIS) for details about this analysis.

Despite the conclusions described in the 2000 REIR/EIS, Delta Wetlands and EBMUD negotiated a protest dismissal agreement describing additional measures that Delta Wetlands would take to address EBMUD's concerns about project effects on Mokelumne River fisheries. See response to Comment C6-5 for more information.

C6-7. Delta Wetlands Project operations would be prohibited from interfering with operations conducted by the SWP and CVP and other existing holders of prior water rights (e.g., EBMUD). Project operations would not be allowed to affect the ability of those holding prior water rights to comply with Delta water quality standards or with requirements for the protection of biological resources. The NEPA and CEQA analysis assumes that Delta Wetlands would not interfere with DWR's and USBR's rights, compliance with the 1995 WQCP, compliance with terms and conditions (e.g., take limits) specified in the biological opinions issued by NMFS and USFWS on the effects of SWP and CVP operations on winter-run chinook salmon and delta smelt, or operation of upstream reservoirs.

Since this comment was submitted, EBMUD and Delta Wetlands have signed and submitted to the SWRCB a protest dismissal agreement that describes measures, including restrictions on Delta Wetlands diversions, to ensure that project operations would not adversely affect EBMUD's actions to protect and enhance the lower Mokelumne River anadromous fishery.

C6-8. The commenter is referring to the discussion of programs and studies that influence the cumulative environment in the Delta in Appendix 2 of the 1995 DEIR/EIS. Since the publication of the 1995 DEIR/EIS, EBMUD has proposed the Supplemental Water Supply Project to obtain water supplies from the American River. The project was analyzed in a 1997 draft EIR/EIS. In response to comments on the draft document, EBMUD and USBR have prepared an additional analysis. A final decision on the project is pending.

As stated in Appendix 2, the need for the Delta Wetlands Project would continue even with implementation of this and other programs described in the 1995 DEIR/EIS and the 2000 REIR/EIS.

C6-9. General descriptions of the computer models used in the 1995 DEIR/EIS analysis are included in the sections entitled "Impact Assessment Methodology" in Chapters 3A, 3B, 3C, and 3F of the 1995 DEIR/EIS and of FEIS Volume 1 and in the technical appendices that accompanied these chapters in the 1995 DEIR/EIS. The models used are available on the compact disc that was produced for the 1997 water right hearing. These models have been revised for the 2000 REIR/EIS and are available from the SWRCB.

BRADFORD RECLAMATION DISTRICT NO. 2059
504 Bank of Stockton Building
311 East Main Street
Stockton, California 95202
(209) 943-5551

December 14, 1995

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1325 J Street, Room 1444
Sacramento, CA 95814-2922

RE: Comments on Draft Environmental Impact Report and Environmental Impact Statement For the Delta Wetlands Project

Gentlemen:

Bradford Reclamation District No. 2059 (hereinafter referred to as R.D. #2059) filed its Protest to Applications 29061, 29062, 29063 and 29066 of Bedford Properties to appropriate from various rivers, sloughs, cuts and channels of the San Joaquin River Delta at points on Bouldin Island, Webb Island, Holland Island and Bacon Island.

Bradford Reclamation District No. 2059 is a reclamation district organized and existing in accordance with the Reclamation District Act, as found in the California Water Code commencing with Section 50,000. The District encompasses all of Bradford Island and contains approximately 2,051 acres, 7.4 miles of levees and has approximately 58 landowners, many of whom reside on the Island.

Bradford Island is located immediately west of Webb Tract (one of the reservoir islands within the Project) across Fisherman's Cut. On the north and west of Bradford Island is the San Joaquin River, the main ship channel to the Port of Stockton.

Access to Bradford Island is only by boat. R.D. #2059, in conjunction with Contra Costa County and Reclamation District No. 2026 (Webb Tract), operates the Delta Ferry Authority which provides ferry service from Jersey Point to Bradford Island and Webb Tract.

Bradford Reclamation District No. 2059, along with several landowners on Bradford Island, filed Protests to the Applications of Bedford Properties, now Delta Wetlands, for the operation of the Project as described in the Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project, dated September 11, 1995 (herein referred to as the "Report and Statement").

Bradford Reclamation District No. 2059 makes the following comments and expresses the following concerns to the Report and Statement as it relates to Bradford Island:

I.
BOAT TRAFFIC

In the Summary (page S-3), Project Alternative describe Alternatives 1 and 2 as including the following:

> "Portions of the habitat islands and the reservoir islands would support recreational activities. Up to 38 private recreation facilities may be located on the perimeter levees of all four islands. These recreation facilities, with up to 40 bedrooms each, will include boat docks in adjacent channels, with 30 boat berths, and boat docks on the island interiors, with up to 36 boat berths, that may be operated year round."

In reviewing the impact of such a project, your attention is drawn to Chapter 3L, and in particular to Impact L-7 on page 3L-12:

> **"Impact L-7: Increase in Boat Traffic and Congestion on Delta Waterways during DW Project Operation.** Implementation of Alternative 1 would result in the addition of 1,116 boat trips on a peak summer day to waterways in the DW project vicinity. Based on estimated recreation use it is estimated that boat trips would increase by approximately 5% over existing

conditions. Also, construction of the recreation facilities would restrict boat speeds on up to approximately 8 miles of Delta waterways. Restricted speeds, combined with boats moving into and out of waterways at the DW facilities, would create boat congestion on days of heavy recreational use. Therefore, this impact is considered significant and unavoidable." (emphasis added)

"**Mitigation.** No mitigation is available to reduce this impact."

This Report accepts the fact that the addition of the recreational facilities described in the Summary above, and that no mitigation is available to reduce this impact.

Reclamation Districts have long contended that one of the greatest impacts on its levees is boat traffic. As the number of boats increase, and the size and speed of those boats also increase, the surrounding levees are negatively impacted.

Reclamation Districts find that boat traffic in the channels surrounding their levees impacts the Districts in the following ways:

1. The wave wash from boat wakes cause the levees to erode and the levee riprap to slip into the water leaving the levees exposed to further erosion.

2. The cost of repairing levees and replacing levee material is continually increasing when monetary resources are declining.

3. Reclamation Districts are restricted in making repairs to its levees without providing substantial wildlife mitigation and habitat at very costly expenditures to the District. C7-1

4. Some levees are constructed of peat and/or sand material and are therefore very fragile. Increased boat traffic is particularly harmful to such levees.

Bradford Reclamation District No. 2059 is one of those districts which have fragile levees and very limited funds with which to maintain its levees. To permit the additional recreational uses described in the Summary and concluding that it will have a significant but unavoidable impact is unacceptable.

Who is going to assist R.D. #2059 in the added costs of maintaining its levees, both in replacing the washed-away materials and the significant financial impact to the District in meeting all of the habitat mitigation requirements placed upon it in order to restore the eroded levees? C7-1 cont'd

Bradford Reclamation District respectfully suggests that this Report and Statement does not adequately address the impact of increased boat traffic on the levees of neighboring islands.

II.
SEEPAGE

It must be recognized that if Webb Tract is flooded, it will result in increased seepage on adjoining islands, and in particular on Bradford Island. This is a fact, for in 1980 when Webb Tract flooded, that very thing occurred on Bradford Island.

This is recognized in the Report and Statement in Chapter 3D on page 3D-13, where it is stated:

> "An engineering model (SEEP) was used by HLA (1989) to analyze seepage potential of water storage on Webb Tract across Fishermans Cut to Bradford Island. This location was identified as being particularly sensitive because of the short seepage distance across Fishermans Cut. Fixed hydraulic levels were tested under a range of permeability conditions of soil materials to determine the effect of flooding and exposed borrow pit excavation. <u>The model indicated that both hydraulic heads and seepage levels in sands on Bradford Island would increase as a result of flooding of Webb Tract.</u> This analysis assumed a water storage elevation of +4 feet based on a previous project description; however, the currently proposed water storage level of +6 feet would not alter the results of the study (Tillis pers. comm.). Seepage levels would still increase on Bradford Island as a result of the proposed +6 feet water storage under Alternative 1." (emphasis added)

So the question is not "if there will be seepage" but rather how much seepage and what can be done to protect Bradford Island.

This Report and Statement suggests that the appropriate mitigation efforts is that of installing a Seepage Interceptor Well System along the western side of Webb Tract and piezometers along the eastern side of Bradford Island. There is no established basis for determining that such a mitigation effort will be adequate to prevent seepage onto Bradford Island. C7-2

The Report and Statement also provides on page 3D-10 other potential mitigation efforts for controlling seepage including (1) installing relief wells at regular spacings near the toes of existing levees on neighboring islands; (2) constructing toe berms with an internal drainage system on neighboring islands; (3) lowering the design pool elevation on the DW reservoir islands; (4) developing wetland easements adjacent to levees on neighboring islands; (5) purchasing farmlands affected by increased seepage; (6) constructing a combination of seep and interior ditches and increasing pumping rates; (7) installing clay blankets; and (8) installing impervious cutoff walls through project island levees.

The fact that so many different and varied alternatives are suggested as a means of mitigating the effect of seepage is an indication that they recognize that there is no simple answer to the problem.

Seepage will have a major impact on Bradford Island. Too much water will not only weaken the District's levees and substantially increase the District's expenses required to maintain and operate its drainage facilities, but will also be detrimental to the agricultural crops and livestock on Bradford Island. C7-3

R.D. #2059 knows that if Webb Tract is flooded that Bradford Island will find itself faced with an unsurmountable burden — the burden of establishing proof that the seepage on Bradford Island is caused by the flooding of Webb Tract. C7-4

Engineers will tell you that water seepage from point A to point B is not the same as following a pipe between two points. Water and the resulting hydraulic head can translate through many layers and strata of earth and come up some distance from the point from which it entered. Seepage resulting from the flooding of Webb Tract will not only affect the land on Bradford Island immediately adjacent to Fishermans Cut, but could also affect land anywhere within Bradford Island. As a result it would be nearly impossible to solve the problem of seepage on Bradford Island with interceptor wells, relief wells, toe berms, clay blankets or impervious cutoff walls through the levees. C7-5 Many of the proposed mitigation efforts would require the construction or installation of mitigating devices to or near the levees of R.D. #2059 or the taking of private property on Bradford Island. C7-6

In conclusion, Bradford Reclamation District No. 2059, and the landowners on Bradford Island, do not want and should not be put in the position of having to prove that increased seepage is in fact coming from the flooding of Webb Tract in order to protect its property rights. The Project should not be approved without substantial and proven mitigation measures that will provide adequate protection to Bradford Island from seepage. C7-6 cont'd

III.
INCREASE SALINITY

The Report and Statement acknowledges that the Project will result in the increase of salinity at Jersey Point.

The life and financial success of Bradford Island is based upon the growth of crops, hay and pasture supporting livestock and each of these require a supply of good quality of water. Increases of salinity in the water surrounding Bradford Island will have a negative impact upon those items.

Bradford Island sits precariously between the salt water of the Suisun Bay on the west and the fresh water of the Sacramento-San Joaquin Delta on the east. It is recognized that if a substantial amount of fresh water is taken out of the channels upstream from Bradford Island — such as Webb Tract and Bacon Island — the salt water on the western side of Bradford Island will move further and further upstream.

Any operation of the Project must contain foolproof measures to protect the supply of good quality water for Bradford Island. C7-7

The agricultural life of Bradford Island supports the economic livelihood of the island. Failure of the landowners on Bradford Island to support their agricultural interests will result in their inability to meet the R.D. #2059 annual assessments which are used to maintain District levees, the District pumps and canals, and the District's share of the ferry.

CONCLUSION

The Report and Statement not only do not adequately address the impact of this Project on Bradford Island, but it is entirely silent on how problems are to be resolved. There is no foolproof C7-8

method of guaranteeing that R. D. #2059 and its landowners will have any recourse to protect themselves without protracted and costly litigation, during which the adverse effects will continue unabated. The Report and Statement should include a definitive dispute resolution process that will protect the adjoining landowners pending the outcome of that process.

C7-8 cont'd

The burden of proof and all costs to and damages of R.D. #2059 created by the Project must not be borne by the District.

R.D. #2059 respectfully requests that the Report and Statement must not be approved without substantial and proven mitigation measures for addressing the concerns raised in this letter by Bradford Reclamation District No. 2059.

Yours very truly,

BRADFORD RECLAMATION DISTRICT
NO. 2059

By _____
Brent Gilbert, Trustee

By _____
Robert C. Benson, Trustee

By _____
E. E. Gilbert, Trustee

PROOF OF SERVICE BY MAIL

1. I am over the age of 18 and not a party to this cause. I am employed in the county where the mailing occurred.

2. My business address is 504 Bank of Stockton Building, 311 East Main Street, Stockton, California 95202.

3. I served the attached

   Comments on Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project

   on each person named below by enclosing a copy in a sealed envelope addressed as shown below and

   a. [X] **depositing** the sealed envelope with the United States Postal Service with the postage fully prepaid.

   b. [ ] **placing** the envelope for collection and mailing on the date and at the place shown in item 4 following our ordinary business practices. I am readily familiar with this business' practice for collecting and processing correspondence for mailing. On the same day that correspondence is placed for collection and mailing, it is deposited in the ordinary course of business with the United States Postal Service in a sealed envelope with postage fully prepaid.

4. a. Date mailed: December 18, 1995 b. Place mailed: Stockton, California.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Date: December 18, 1995

Roxane Brannon

NAME AND ADDRESS OF EACH PERSON SERVED BY MAIL

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1325 J Street, Room 1444
Sacramento, CA 95814-2922

Bradford Reclamation District No. 2059

C7-1. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities". As discussed in Master Response 5, the following mitigation has been proposed in an attempt to reduce impacts associated with boat traffic:

> **Mitigation Measure: Reduce the Number of Outward Boat Slips Located at the Proposed Recreation Facilities**. Delta Wetlands shall reduce the total number of outward (channel-side) boat slips proposed on the Delta Wetlands islands by 50%.

Implementation of this mitigation measure would reduce boat traffic and, therefore, the potential for increased costs of levee maintenance for adjacent islands. However, it is not possible to quantify potential increased levee maintenance costs associated with boat traffic.

C7-2. The commenter is referring to information or analysis in the 1995 DEIR/EIS that was replaced or augmented by the 2000 REIR/EIS. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents a new analysis of the potential seepage impacts of Delta Wetlands reservoir operations and an evaluation of the effectiveness of the proposed seepage performance standards. Based on this analysis, a new mitigation measure (Modify Seepage Monitoring Program and Seepage Performance Standards) is recommended to improve the proposed seepage control system and reduce potential impacts of the project to a less-than-significant level.

C7-3. As described on page 3D-3 of the 1995 DEIR/EIS (page 3D-3 of Chapter 3D of FEIS Volume 1), seepage contributes to erosion problems and subsequent levee instability. Additionally, seepage can affect existing agricultural uses by changing groundwater levels. The 1995 DEIR/EIS and the 2000 REIR/EIS recognized the detrimental effects of seepage and addressed the potential influence of the Delta Wetlands Project reservoir islands on seepage to neighboring islands.

C7-4. The interceptor well system and seepage monitoring program developed for the Delta Wetlands Project are designed to detect changes in water levels caused by the project. This is accomplished by monitoring background locations where the Delta Wetlands Project would not likely influence water levels and comparing those levels to the level on islands adjacent to the Delta Wetlands Project reservoir islands. This system would be used to establish proof of the causal relationship between water storage on Webb Tract and groundwater levels on Bradford Island. See also Chapter 3D of FEIS Volume 1, Appendix H of the 2000 REIR/EIS, and responses to Comments C6-2 and C7-2.

C7-5. The commenter notes that seepage may extend through deeper aquifer formations or may find a path of least resistance to a neighboring island some distance from the levees directly across from the reservoir island.

Delta Wetlands proposes to use a string of interceptor wells at the perimeter of a reservoir island and to measure the wells' effectiveness at distances at least equal to the width of a slough. This approach would create a very wide drawdown area that would act as a sump or low point and should attract most seepage. As noted by the commenter, seepage could occur at other locations or depths not easily mitigated by the initial perimeter well system. However, the basic concepts of the seepage monitoring and mitigation program would apply to this situation. If seepage monitoring by Delta Wetlands or the adjacent reclamation district indicated that the adjacent island's water levels correlated with the filling and emptying of the Delta Wetlands reservoir island (versus changes associated with existing conditions such as weather, irrigation practices, or water levels in adjacent channels), deeper wells could be installed to increase the drawdown area and intercept seepage through much lower aquifers. Another option would be to modify operation of the reservoir islands to avoid the observed seepage effects.

C7-6. The commenter states that "many of the proposed mitigation efforts would require . . . the taking of private property on Bradford Island". The fifth amendment of the U.S. Constitution restricts government from "taking" private property without just compensation. Delta Wetlands does not propose to locate mitigation wells or other devices on private property without the owner's consent.

The purpose of the interceptor well system and seepage monitoring program developed for the Delta Wetlands Project is to detect changes in water levels caused by the project and mitigate those changes. The data collected by monitoring wells on the levees of Delta islands would be used to determine the influence of the Delta Wetlands Project on groundwater levels. At the start of Delta Wetlands' groundwater monitoring program, Delta Wetlands sought permission from reclamation districts to install piezometers (i.e., monitoring wells) on nearby islands. Most districts responded favorably and allowed Delta Wetlands to install piezometers on their island, but a few, including Bradford Island's reclamation district, did not permit the installation of piezometers. Delta Wetlands received permission to install groundwater monitoring wells on the following islands:

Bethel Island,
Hotchkiss Tract,
Holland Tract,
Veale Tract,
Palm Tract,
Woodward Island,
Upper Jones Tract,
McDonald Island,
Mandeville Island,
Quimby Island,
Venice Island,
Empire Tract,
Terminous Tract,

Bouldin Island,
Staten Island,
Grand Island, and
Andrus Island.

This information indicates that most neighboring landowners and/or reclamation districts would be willing to allow Delta Wetlands to install monitoring wells on their islands. Also, monitoring wells can be placed either on the levee of a neighboring island or beyond the toe of the neighboring levee; therefore, Delta Wetlands can approach both the reclamation districts, which have jurisdiction over the levees, and the adjacent landowners, who have jurisdiction over land beyond the toe of the levee, for permission to place a well.

In those areas where the landowner and the reclamation district on a neighboring island do not allow Delta Wetlands to install seepage monitoring wells, monitoring wells would be installed on the Delta Wetlands reservoir island levees. As determined by the seepage analysis in Appendix H of the 2000 REIR/EIS, the spacing of interceptor wells on the Delta Wetlands reservoir islands depends on local conditions; however, spacing would be approximately 160 feet on center, which provides enough space to install monitoring wells between the interceptor wells. Delta Wetlands would collect groundwater data from the interceptor wells and the monitoring wells on the reservoir island to determine the average head beneath the reservoir island levee. This information could be used to demonstrate whether the water table at the edge of the reservoir island was within its historical range.

C7-7. As described in Chapter 3C of the 1995 DEIR/EIS and of FEIS Volume 1, the potential effects of Delta Wetlands Project operations on salinity were assessed for Chipps Island, Emmaton, Jersey Point, and Delta exports. Bradford Island is adjacent to Jersey Point; therefore, the potential effects of project operations on salinity described for Jersey Point are directly applicable to salinity at Bradford Island. The largest effects of the Delta Wetlands Project on salinity would occur during diversions to the reservoir islands. These potential effects would be reduced by implementation of Mitigation Measures C-1, C-2, and C-3, which would ensure that diversions are adjusted to preclude significant increases in salinity at Chipps Island, Emmaton, and Jersey Point, respectively.

Additional measures (FOC) for protection of fish habitat have been developed through the ESA consultation process. These measures limit the distance that the salinity gradient can move upstream; therefore, they reduce the change in salinity that would be observed at Bradford Island. The FOC provide substantial protection against salinity intrusion during Delta Wetlands diversions by delaying the initial Delta Wetlands diversions until X2 is located downstream of Chipps Island; see response to Comment A7-3. With implementation of the FOC, the estimated effects of project diversions on salinity at Jersey Point would be substantially less than those reported in the 1995 DEIR/EIS, but the impact is still considered significant; see the 2000 REIR/EIS Chapter 3C of Volume 1 of this FEIS.

The Delta Wetlands WQMP provides additional measures to protect salinity conditions in the Delta. See response to Comment C9-17 for more information about salinity protection provided in the WQMP.

C7-8. The commenter requests that the lead agencies include a dispute resolution process as a mitigation measure in the NEPA and CEQA analysis. The physical, environmental effects of the proposed project have been addressed in the NEPA and CEQA documentation, and adequate mitigation has been identified for those impacts. A dispute resolution process does not directly address the physical effects of the project and is not required as mitigation for project effects.

During the 2000 water right hearing, Delta Wetlands and EBMUD submitted a protest dismissal agreement that includes a dispute resolution procedure to identify and remedy levee stability, seepage, and related problems that may be caused by operation of the reservoir islands. This process would be open to any entity or individual, including neighboring reclamation districts, that may be injured by the reservoir operations of the Delta Wetlands Project. As described in the protest dismissal agreement, the Reservoir Island Monitoring and Action Board, a neutral technical engineering advisory panel, would investigate problems purportedly caused by reservoir operations and recommend remedial actions to address problems determined to be caused by Delta Wetlands Project operations. Delta Wetlands and EBMUD requested that this agreement be included in the terms and conditions of permits issued by the SWRCB for the Delta Wetlands Project; the SWRCB incorporated some terms of the agreement into the water right terms and conditions. It should be noted that nothing in the process described in the Delta Wetlands–EBMUD agreement would prevent complaining parties from pursuing judicial remedies in state court.

COUNTY OF SACRAMENTO

WATER RESOURCES DIVISION.....KEITH DEVORE, Chief
County Administration Building
827 Seventh Street, Room 301
Sacramento, California 95814
Phone: (916) 440-6851
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PUBLIC WORKS AGENCY

DOUGLAS M. FRALEIGH, Administrator
WARREN H. HARADA, Director
Public Works Administration
ROBERT F. SHANKS, Director
District Engineering
TERRY T. TICE, Director
County Engineering

December 20, 1995

State Water Resources Control Board
Division of Water Rights, Third Floor
901 P Street
Sacramento, CA 95812-2000

Attn: Mr. Jim Sutton

SUBJECT: Comments on the DEIR/DEIS for the DELTA WETLANDS PROJECT

Dear Mr. Sutton:

Enclosed herewith are comments/questions from Ms. Roberta Hettick of the Sacramento County Water Resources Division regarding the subject project. Included with these comments are several other issues that should be resolved within the EIR/EIS for this project. These issues are as follows:

1) The effect this project will have on the 100-year water surface elevations due to the raising and widening the perimeter levees on the reservoir islands. Please note that within the County Floodplain Management Ordinance, there are restrictions on the height levees may be raised and the incremental amount that water surfaces may be increased due to projects. Since Sacramento County is the regulatory agency in charge of enforcing the National Flood Insurance Program's (NFIP) standards and guidelines for the Delta, it must be shown that this project will be in conformance to NFIP standards. **C8-1**

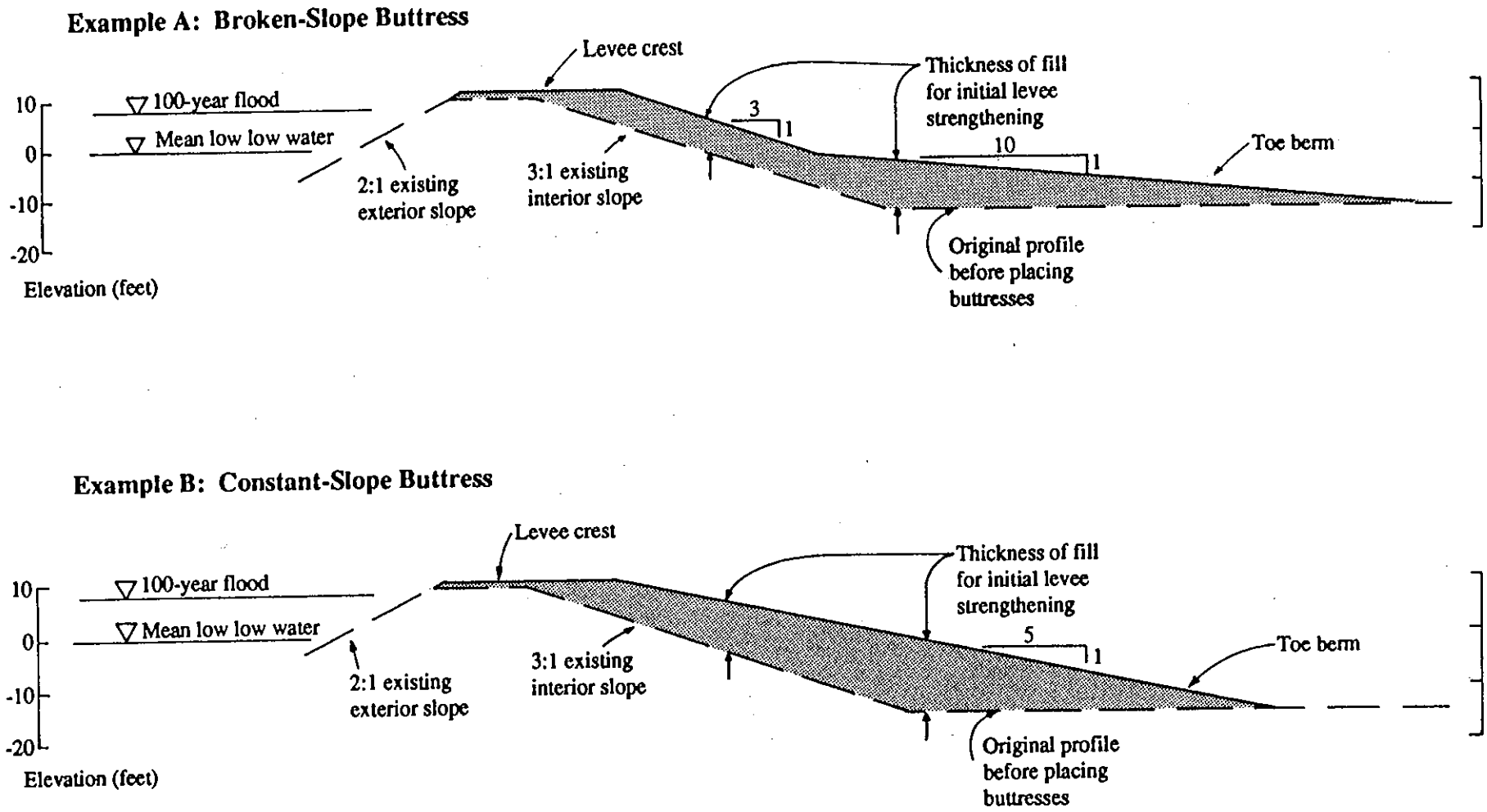
2) Sacramento County is currently going through the process of a FEMA map revision for the North Delta area. It will need to be shown what effect this project will have on 100-year water surface elevations within the islands and adjacent watercourses, and how these compare to the elevations determined within the previously submitted FEMA map revision.

If you have any questions, please feel free to contact Ms. Hettick or myself at (916) 440-6851.

Sincerely,

Steven M. Pedretti
Senior Civil Engineer

Attachment
302/32.08
SMP:jjp



Source: Harding Lawson Associates 1993.

Figure 3D-2.
Examples of Initial Levee Strengthening on Reservoir Islands

DELTA WETLANDS
PROJECT EIR/EIS
Prepared by: Jones & Stokes Associates

MEMORANDUM

Date: December 19, 1995

Subject: Delta Wetlands Project Draft EIR/EIS Comments

From: Roberta Hettick, WRD, Drainage Master Planning

To: Steve Pedretti, WRD, Development

Comments for Jones & Stokes Associates, Inc.:

Sacramento County is currently conducting flood control studies based on the Sacramento County Storm of Record (1986). Our study boundaries include the Beach/Stone Lakes area downstream to Tyler and Staten Islands, but do not reach further south into the Delta Wetlands Project.

1) What design storm was used in the EIR/EIS for modeling of flood events? How does that storm compare to the 1986 Storm of Record used by Sacamento County?

2) Sacramento County's concern is that flood event WSELs are analyzed for the immediate area and for points upstream. The normal operation of the proposed reservoirs would be to collect water during high flows, but is there a case scenario which includes water being discharged into the Delta during a flood event? If water were discharged into the Delta during a flood event, the local WSEL would be adversely affected. However, no adverse effects were predicted by the models executed in this EIR/EIS. We feel these "favorable results" are primarily due to two points: 1) Jones & Stokes analysis of monthly average flow as opposed to a Storm of Record peak event, and 2) The assumption that even under worst case conditions, the reservoirs would not pump water into the Delta during a flood event. An investigation of the 100-year flood event in combination with the worst case discharge will be necessary to determine the full effects on local and upstream WSELs. **C8-1 cont'd**

3) If discharge did occur during the Storm of Record, what affect would it have (in reference to the 100-year water surface elevation) on the neighboring channels, the Georgiana Slough, Snodgrass Slough, and the North and South Forks of the Mokelumne Rivers? Changes to the WSELs by as little as a tenth of a foot can be significant given critical flooding in the area.

4) In the past, the raising of levees has had adverse impacts to WSELs in Sacramento County waterways. Please address the impact of the project to WSELs specifically from raising levees, taking into account the above mentioned worst case senario. Please analyze any adverse effects due to construction or operation of the project, specifically with respect to the Georgiana Slough near Isleton, Snodgrass Slough, and the North and South Forks of the Mokelumne River.

cc: Craig Crouch, Water Resources Division
Terri Wegener, WRD, Drainage Master Planning

Background to Jones & Stokes Comments

Objective:

I reviewed the Draft EIR/EIS and the Appendices for the Delta Wetlands (DW) Project specifically looking for impacts to Sacramento County waterways. I looked for information related to water surface elevation (WSEL) changes caused by the project and other upstream effects.

Project Location:

The project islands are located within Contra Costa and San Joaquin Counties. However, the northerly two islands are immediately adjacent to Sacramento County. The Georgiana Slough indirectly connects the two northern islands with the Isleton area, which is approximately 1.8 miles upstream (please see the attached map). The orientation of the four project islands indicates the greatest impacts (of interest to Sacramento County) would occur on the Georgiana Slough, the San Joaquin River, and the North Fork of the Mokelumne River. The main confluence of the Sacramento River occurs approximately 14 miles downstream of the project (measured along the San Joaquin River).

Modeling:

Little information relating to specific 100-year WSELs was found. The EIR/EIS uses hydrodynamic models developed specifically for the Delta, by Resource Management Associates (RMA) and Jones & Stokes Associates, Inc. The models incorporate tidal forces, inflow, outflow, water exports and other variables to produce monthly average net channel flows (Delta Wetlands Project Draft EIR/EIS, p.3B-3). The models used do not translate to a direct 100-year WSEL which Sacramento County would normally compare to upstream studies for evaluation of flood impacts.

Influence of Diversion and Discharge on WSELs:

The chapter titled "Flood Control" dealt primarily with keeping flood waters from breaching the island levees. The normal operation of the reservoirs would be to collect water during high flows, but in a worst case senario, could water be discharged the Delta during a flood event? In this worst case, what effect will it have on the WSEL in the neighboring channels, the Georgiana and Snodgrass Sloughs, and the North and South Forks of the Mokelumne River? The report nearly answers this question in Chapter 3: "Hydrodynamic simulation of channel flows, velocities, and stages during periods of maximum DW diversions and maximum DW discharges indicate that the channel stages most affected by DW operations would be those in the south Delta." . . . "The results indicate that stages would not be substantially changed by DW operations. The minimum and maximum stages would be lowered in some channels by as much as 0.25 feet (3 inches). However because these south Delta channels normally experience tidal fluctuations of more than 5 feet, this is not considered a substantial change (5%) for these south Delta channels." (idem, p. 3B-17).

These statements would imply that discharge of waters from the reservoirs would not adversely affect the WSELs of neighboring channels. *However these studies used monthly averages for stage, and do not assume dicharge during the flood event.* The modeling and comparison of flows using monthly averages implies the peak flood events were not specifically studied in this report, but were averaged into the flows for a given month. In pursuit of more information regarding the modeling

of flood conditions, I placed a call to Jordan Lang of Jones and Stokes Associates, Inc. (leaving a message to call). I was referred to Ken Bogdan and then to Amy Dour. According to Ms. Dour, there is not a significant chance that discharge pumping would occur from the reservoir islands during a flood event. The normal operation of the reservoir would be to collect water during high flows. She did however, encouraged us to include our concerns in an official comment. I also tried to contact Russ Brown at Jones & Stokes to discuss the design storm used in the Draft EIR/EIS modeling. He has not yet returned my call.

Levees

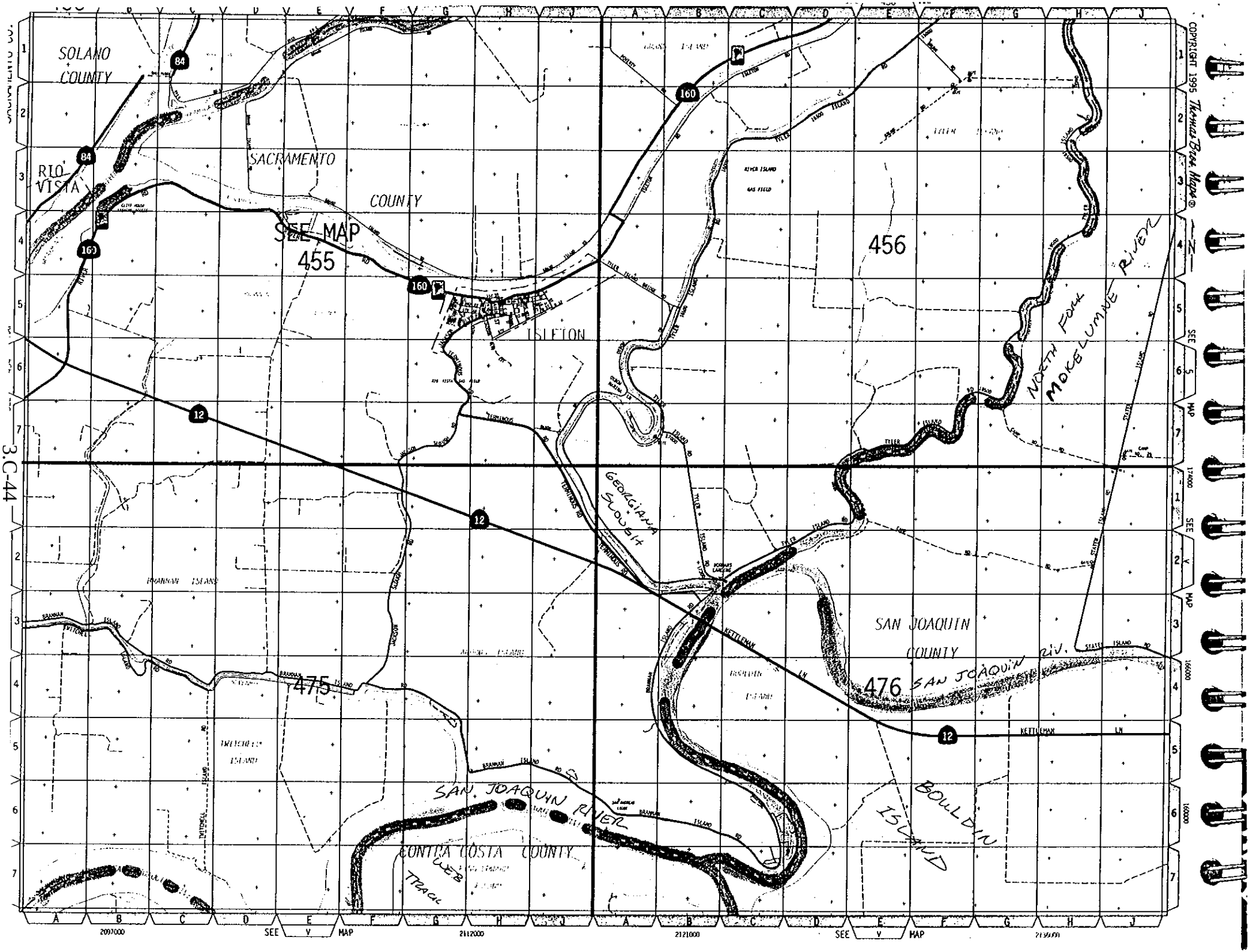
Alternatives 1 and 2 of the Draft EIR/EIS propose "to raise and widen the perimeter levees on the reservoir islands to hold water at a maximum elevation of +6 feet." (idem, p. 2-8) The Draft EIR/EIS did not analyze or mention the effect to neighboring areas of raising reservoir levees. The "Criteria for Determining Impact Significance" (idem, p. 3D-7) do not include any remarks regarding flooding effects to neighboring areas. Cross sections of the proposed levee improvements are attached.

The report did analyze the levee stability of the alternatives and the factor of safety, to the islands themselves. According to the report, when the reservoirs are full or partially full, the risk of levee breach will be lower than existing due to reduced hydraulic head between the Delta channel and the interior of the reservoir (from 16-18 feet of head currently, to 6 feet when the reservoirs are full). (idem, p. 3D-13)

Summary:

Drainage Master Planning's concern is that flood event WSELs are addressed for the immediate area and for points upstream. The storage of water and management of a wild life habitat would probably have little impact on drainage channels in Sacramento County. If water is pumped out of the reservoirs during flood events, the local WSEL would be adversely affected in the immediate vicinity of the islands, but adverse effects in Sacramento County (or elsewhere) were not predicted by the models executed in this Draft EIR/EIS. An investigation of the 100-year flood event in combination with diversion and pumping activities would be necessary to determine the full effects (a combination of events that has very little chance of occurring, according to Jones & Stokes). It does not appear this type of study was conducted for the Draft EIR/EIS Report. Adverse effects of raising the reservoir island levees should also be addressed in the comments to Jones & Stokes Associates. The net effect of discharge during a peak flood event may not be significant in light of 5 foot WSEL changes due to tidal forces.

Also, the report did make the significant point that the long term effects of this project are unforeseen, since it may be used at a later date for entirely different purposes and under different operating conditions. (Executive Summary for the Draft EIR/EIS, Delta Wetlands Project, p.22)


SOLANO COUNTY
RIO VISTA
SACRAMENTO COUNTY
SEE MAP 455
456
ISLETON
NORTH FORK MOKELUMNE RIVER
GEORGIANA SLOUGH
BRANNAN ISLAND
SAN JOAQUIN COUNTY
475
476
SAN JOAQUIN RIV.
KETTLEMAN LN
SAN JOAQUIN RIVER
CONTRA COSTA COUNTY
BOULDIN ISLAND
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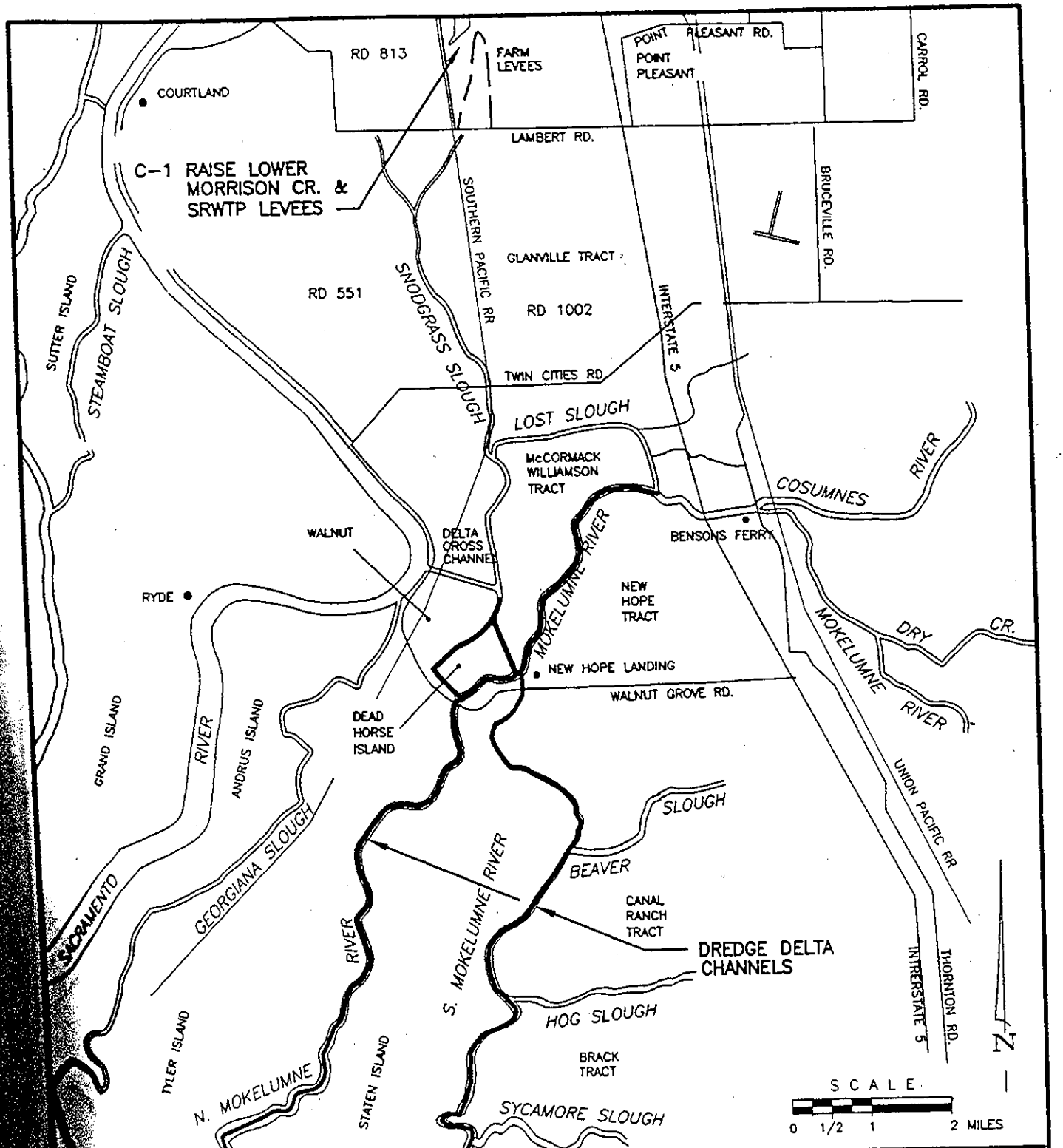


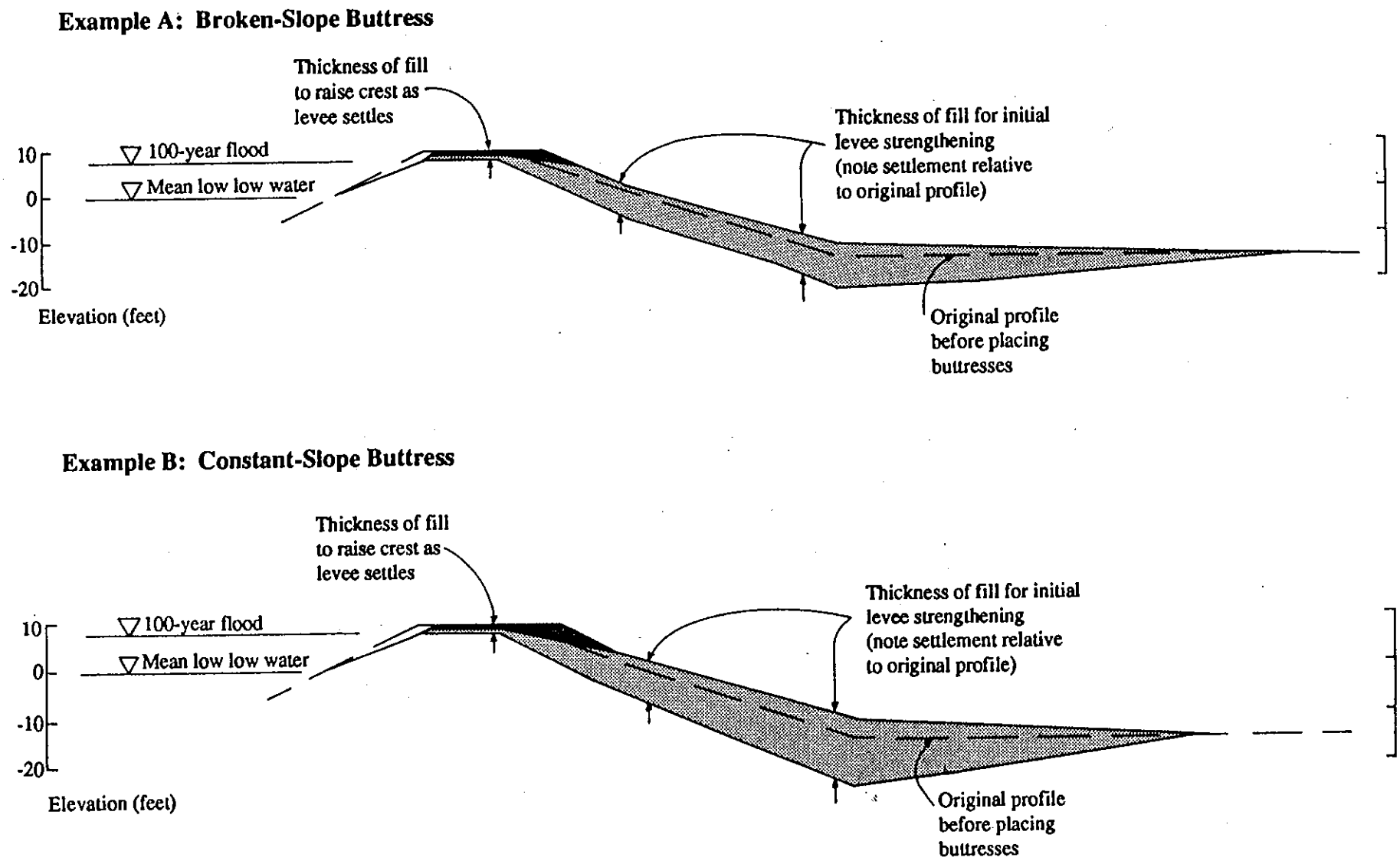
SACRAMENTO COUNTY

BEACH-STONE LAKES FLOOD CONTROL TASK REPORT

ALTERNATIVE 9

DWR CHANNEL DREDGING ALTERNATIVE

FIGURE 2-4



Source: Harding Lawson Associates 1993.

Figure 3D-5.
Examples of Settlement of Initial Fill and Rising Crest with Additional Fill

DELTA WETLANDS
PROJECT EIR/EIS
Prepared by: Jones & Stokes Associates

Sacramento County Water Resources Division

C8-1. The widening of the reservoir islands would not affect the adjacent channel width or 100-year flood level because new levee material would be placed almost entirely on the interior slope of the islands (see Figures 3D-2 and 3D-5 in FEIS Volume 1), not in adjacent channels. Additionally, the proposed levee design for the Delta Wetlands reservoir islands conforms to DWR's Bulletin 192-82 recommendations for flood control in the Delta.

Based on the proposed operation of the Delta Wetlands Project, water would not be discharged into adjacent channels during a flood event. The intent of the Delta Wetlands Project is to capture high floodflows and store them until there is a demand for water to export or outflow. Appendix B1, "Hydrodynamic Modeling", of the 1995 DEIR/EIS presents the results of simulated changes in water surface elevations during periods of Delta Wetlands' diversions and discharges; see Table B1-9, "Simulated Stage Differences during Periods of Maximum Delta Wetlands Diversion (9,000 cfs) and Maximum Delta Wetlands Discharge (6,000 cfs) at Selected Nodes of the RMA Delta Hydrodynamic Model". The RMA model uses historical hydrologic information to determine channel flows and stages. As illustrated in the table, the maximum simulated increase in water surface elevations in the north Delta (i.e., Georgiana Slough and Sacramento River) during Delta Wetlands discharges was 0.01 foot.

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General Manager

December 20, 1995

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Division of Water Rights
P.O. Box 2000
Sacramento, California 95812-2000
Attn: Jim Sutton

U.S. Army Corps of Engineers
Regulatory Branch
1325 J Street, 14th Floor
Sacramento, California 95814-2922
Attn: Jim Monroe

Re: Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project (dated September 11, 1995)

Dear Mr. Sutton and Mr. Monroe:

This letter and its Appendix set forth the comments of the Contra Costa Water District ("CCWD" or "District") on the Draft Environmental Impact Report and Environmental Impact Statement ("EIR/EIS") for the Delta Wetlands ("DW") Project dated September 11, 1995. This project pertains to Water Right Applications 29061, 29062, 29063 and 29066 dated December 4, 1987 and revised and new applications 30267, 30268, 30269 and 30270, dated August 6, 1993.

The September 1995 Draft EIR/EIS for the Delta Wetlands Project:

1. Fails to adequately assess the impacts of the project on CCWD and its customers. The project will result in unacceptable adverse effects on municipal water supplies and damage CCWD and its customers by:
   a. Impairing the beneficial uses to which the water supplied by CCWD is put.
   b. Increasing salinity at the District's drinking water intakes by significantly reducing Delta outflow.
   c. Discharging poor quality water with elevated levels of organic carbon, algae, salt, and possibly other contaminants.

C9-1

d. Impairing the operation and degrading the performance of the Los Vaqueros Project. C9-1 cont'd

2. Contains methodological errors and does not adequately address water quality impacts:
   a. The document is methodologically flawed because it does not distinguish between the water quality impacts at the District's diversion points and the State Water Project (SWP) and Central Valley Project (CVP) export pumps. The water quality impacts can be significantly different at the different intake locations.
   b. THM formation potential and total organic compounds (TOC) impacts are underestimated with respect to future water quality standards. C9-2
   c. The document improperly deems unacceptable levels of significant water quality degradation to be "acceptable".
   d. The document improperly deems a number of impacts to be "acceptable" by using inadequate and/or inaccurate analyses on their potentials for water quality degradation.

3. Analyzes the Project in a way that does not accurately reflect the likely mitigated operations of the Project. Mitigated measures proposed in the Draft EIR/EIS are likely to change project operations and the corresponding environmental impacts significantly. C9-3

4. Fails to provide adequate mitigation plans for identified significant impacts, including those which have unacceptable adverse impacts on municipal water supplies, and in particular to the District and its customers. C9-4

5. Fails to identify willing buyer(s) for Project water and, therefore, fails to adequately assess the cumulative environmental and economic impacts of the use of water from the Project. C9-5

6. Fails to provide adequate mitigation measures to protect biological resources that would otherwise be adversely impacted by DW operations. C9-6

Details of these comments are discussed in the Appendix to this letter.

In summary, the Draft EIR/EIS is deficient in numerous respects. The Draft EIR/EIS is legally required to contain a <u>detailed</u> mitigation plan to ensure that the project does not significantly affect Delta water quality; that it does not impair the beneficial uses to which the water is put; that it does not adversely affect the users C9-7

of the water supplied by CCWD; that it does not cause unacceptable adverse impacts on municipal and industrial water supplies; that it does not conflict with the operations of the Los Vaqueros Project; and that it would not harm endangered and threatened species. Because of these significant impacts and the lack of sufficient information regarding the mitigated project operations, a new or supplemental Draft EIR/EIS may need to be prepared and circulated for additional review and comment. **C9-7 cont'd**

The District appreciates your consideration of these comments. The District would welcome an opportunity to discuss our concerns with you and would be happy to provide any information necessary, especially details concerning the Los Vaqueros Project. Please direct any technical questions to Dr. Richard Denton who can be reached at (510) 688-8187.

Sincerely,

Walter J. Bishop

Walter J. Bishop
General Manager

WJB/RAD

cc: John Winther
City of Antioch
California Urban Water Agencies

Appendix.

Detailed Comments of the Contra Costa Water District on the Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project dated September 11, 1995.

This appendix consists of five parts:

I: Summary and overview of the comments of the Contra Costa Water District ("CCWD" or "District") on the Draft Environmental Impact Report and Environmental Impact Statement ("EIR/EIS").
II: Description of CCWD's existing water system and new facilities under construction.
III: Description of methodological deficiencies in the Draft EIR/EIS.
IV: Discussion of impacts of the proposed project and mitigation measures.
V: Description of deficiencies in the analyses and scope of the Draft EIR/EIS under the pertinent provisions of the California Environmental Quality Act, Pub. Res. Code § 21000 et seq. ("CEQA") and the National Environmental Policy Act, 42 U.S.C. § 4321 et seq. ("NEPA").

I. SUMMARY OF COMMENTS

The September 1995 Draft EIR/EIS for the Delta Wetlands ("DW") Project:

1. Fails to adequately assess the impacts of the project on CCWD and its customers. The project will result in unacceptable adverse effects on municipal water supplies and damage CCWD and its customers by:
   a. Impairing the beneficial uses to which the water supplied by CCWD is put.
   b. Increasing salinity at the District's drinking water intakes by significantly reducing Delta outflow.
   c. Discharging poor quality water with elevated levels of organic carbon, algae, salt, and possibly other contaminants.
   d. Impairing the operation and degrading the performance of the Los Vaqueros Project.

2. Contains methodological errors and does not adequately address water quality impacts:
   a. The document is methodologically flawed because it does not distinguish between the water quality impacts at the District's diversion points and the State Water Project (SWP) and Central Valley Project (CVP) export pumps.

The water quality impacts can be significantly different at the different intake locations.

b. THM formation potential and total organic compounds (TOC) impacts are underestimated with respect to future water quality standards.

c. The document improperly deems unacceptable levels of significant water quality degradation to be "acceptable".

d. The document improperly deems a number of impacts to be "acceptable" by using inadequate and/or inaccurate analyses on their potentials for water quality degradation.

3. Analyzes the Project in a way that does not accurately reflect the likely mitigated operations of the Project.

4. Fails to provide adequate mitigation plans for identified significant impacts, including those which have unacceptable adverse impacts on municipal water supplies.

5. Fails to identify willing buyer(s) for Project water and, therefore, fails to adequately assess the cumulative environmental and economic impacts of the use of water from the Project.

6. Fails to provide adequate mitigation measures to protect biological resources that would otherwise be adversely impacted by DW operations.

II. CCWD OPERATIONS AND FACILITIES

CCWD operates raw water distribution facilities, water treatment plants and treated water distribution facilities. CCWD supplies raw water to Antioch, Concord, Diablo Water District (serving Oakley), Pittsburg, Southern California Water Company (serving Bay Point), Martinez, parts of Pleasant Hill and Walnut Creek. CCWD serves approximately 400,000 people throughout north-central and east Contra Costa County. Its clients include 10 major industries, 36 smaller industries and businesses, and 50 agricultural users.

The Contra Costa Water District is entirely dependent upon the Delta for its water supply. The Contra Costa Canal system is currently CCWD's principal water supply and delivery system. This system obtains water from unregulated and regulated flows from the Bureau of Reclamation's ("Bureau") Central Valley Project ("CVP") storage releases from Shasta, Folsom, and Trinity Lakes into the Sacramento River. Diversions and rediversions are then made in the Delta to CCWD's system at Rock Slough. Under Water Service Contract I75r-3401 (amended) with the Bureau, CCWD can divert up to 195,000 acre-feet per year

("af/yr") of water from Rock Slough. Currently, CCWD uses between 125,000 and 140,000 af/yr. CCWD can also divert up to 26,780 af/yr of water from Mallard Slough in the Delta. (Water Rights License No. 3167 and Permit No. 19856). The City of Antioch and Gaylord Container, customers of the District, also have water rights permits in the Delta.

CCWD has obtained its water from the Delta since 1940. Delta water is subject to wide variations in salt and mineral concentrations and this water supply has made CCWD and its customers vulnerable to any man-made or natural sources that could degrade Delta water quality. The proximity of the project discharges to CCWD's intakes makes CCWD and its customers the most vulnerable to water quality degradation that would result from the Delta Wetlands project.

Water quality changes in Delta water are noticeable to those who drink the water or use the water in commercial and industrial processes. Degradation in water quality is objectionable to many CCWD customers, costly to all residential and industrial users, and a health risk for some individuals. Degradation impairs the beneficial uses of water supplied by CCWD.

CCWD is committed to supplying its customers with the highest quality water practicable and providing all reasonable protection of the supply from any known or potential source of hazardous contamination. CCWD Resolution No. 88-45 states in part that:

> *"CCWD is committed to reducing the concentration of sodium and chloride in the District's water, thereby reducing household and landscape irrigation concerns and industrial and manufacturing costs caused by the fluctuating sodium and chloride level of the District's Delta source...."*

In May 1987, CCWD's Board of Directors adopted desired quality objectives for water distributed within its service area. The acceptable levels of sodium and chloride were established at 50 milligrams per liter (mg/l) and 65 mg/l, respectively. In 1988, the voter-constituents of CCWD approved the issuance of bonds to finance a $450 million water quality and reliability project known as the Los Vaqueros Project. The primary purposes of the Los Vaqueros Project are to improve the quality of water supplied to CCWD customers and minimize seasonal quality changes, and to improve the reliability of the emergency water supply available to CCWD. The Los Vaqueros Project consists of a reservoir with about 100,000 acre-feet of storage, a new point of diversion (at Old River south of Highway 4

crossing) in conjunction with the current Rock Slough diversion point, associated water conveyance and delivery facilities, pumping plants and other facilities. (1) | C9-8

On June 2, 1994, the State Water Resources Control Board issued Decision No. 1629 which gives CCWD additional rights to divert and store water for beneficial uses. The State Board subsequently issued Water Rights Permit No. 20749 and 20750 for filling Los Vaqueros Reservoir from the new intake at Old River near Highway 4 and diversion and storage of the waters of Kellogg Creek. These rights are in addition to the contractual rights to divert and store water furnished through the Central Valley Project. Construction of the reservoir began in September 1994 and it is expected that diversion from the Old River intake will begin in late 1996 or early 1997. Up to 95,850 af/yr may be diverted for storage between November 1 of each year to June 30 of the succeeding year under Permit No. 20749. To meet the objective of 65 mg/l chloride in its water supply, CCWD will divert when water quality at the Old River intake is below 50 mg/l in chloride concentration.

III. METHODOLOGICAL DEFICIENCIES IN THE DRAFT EIR/EIS

CCWD is concerned that the Draft EIR/EIS contains numerous methodological and technical flaws which affect the descriptions of proposed DW operations, the analyses of environmental impacts of these operations, and, ultimately, the validity of the conclusions reached. To the extent that changes in the methodology or data affect the document's results or conclusions, the Draft EIR/EIS may need to be recirculated for additional review and comment. The following is a description of the document's more significant methodological and technical flaws (materials in the Draft EIR/EIS are referred to in underscored italics): | C9-9

1. The Delta operations model (DeltaSOS) that is used in the Draft EIR/EIS does not have the ability to reoperate upstream reservoirs or account for changes in reservoir storage and demand south of the Delta (*page A2-2*). Without this information, it not possible to establish the relationship between available export pumping capacity, the ability of Delta Wetlands to sell water south of the Delta, and the resulting | C9-10

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(1) CCWD's Rock Slough intake and Contra Costa Canal connection (from the intake to Cypress Road) have been erroneously omitted in Figure 3E-1, Transportation and Water Conveyance Infrastructure in the DW project vicinity, in the Draft EIR/EIS. CCWD's Old River intake and pipeline for the Los Vaqueros Project reservoir (under construction) are also missing and should be clearly identified in that figure. | C9-8 cont'd

environmental impacts. Similarly, it is difficult to assess the possible environmental and water supply benefits of saving water in upstream reservoirs and using DW discharges to provide water for export.

The project proponents need to remodel the Delta Wetlands Project operations by incorporating a DW project node into a Central Valley operations model such as DWRSIM and then rerunning DWRSIM with updated DW operations from DeltaSOS. This process might require several iterations to ensure that changes in exports and flows resulting from DW operations are properly reflected in the reoperation of upstream and south-of-Delta reservoirs, then environmental impacts can be analyzed. **C9-10 cont'd**

2. The Draft EIR/EIS uses output from Central Valley Operations Study runs from the California Department of Water Resources DWRSIM model as input to DeltaSOS. However, as discussed on *page A3-6*, intermediate adjustments were first made to the simulated CVP and SWP exports. The simulated exports from DWRSIM runs were apparently increased to prevent an exaggeration of the ability of the DW Project to sell water to south-of-the-Delta users. These adjustments were not modeled to take into account demand or reservoir capacity south of the Delta (see Comment #1 above). The adjustments to CVP and SWP exports also reduced the Delta outflow below that originally simulated by DWR using DWRSIM, and because of the assumed increase in demand, effectively changed the operations studies from an existing level of development to some future condition. **C9-11**

The project proponents need to account for the actual level of demand for south-of-Delta water by incorporating a DW project node into a Central Valley operations model such as DWRSIM and then rerunning DWRSIM with updated DW operations from DeltaSOS. As discussed in the previous comment, this process might require several iterations to ensure that changes in exports resulting from DW operations properly reflect the demand and available storage south of the Delta. The District made the same request in its comments to the December 1990 Draft EIR/EIS on page 6 of CCWD's April 30, 1991 comment letter to Jim Canaday (SWRCB) and Jean Elder (ACOE). Environmental impacts can be fully analyzed when operations are correctly shown.

3. The Draft EIR/EIS treats the Contra Costa Water District's existing intake at Rock Slough and the SWP and CVP export pumps as a single south Delta point of diversion with the same water quality. In reality, the chlorides at the Rock Slough intake to the Contra Costa Canal can be significantly higher than export water quality during periods of seawater intrusion. Conversely, during periods of significant agricultural drainage from the San Joaquin Valley, the land-derived salts at the CVP's Tracy **C9-12**

Pumping Plant may be significantly higher than at Rock Slough. For the District to be able to assess the impact of the Delta Wetlands Project at its Delta diversion points (Rock Slough, Mallard Slough, and the soon to be completed intake at Old River near Highway 4, as well as the intake of the City of Antioch), it is imperative that a more detailed water quality model be used. The District has raised this concern on page 4 in the Appendix of the District's February 10, 1995 letter (Richard Denton to Jim Sutton, SWRCB) reviewing the draft water quality technical appendices. C9-12 cont'd

More detailed water quality simulations need to be performed, for example, by incorporating a DW operations algorithm into a validated Delta hydrodynamic and salinity model such as the Fischer Delta Model and operating the model over the full historical hydrologic period, 1922-1991. This type of model would provide simulated water quality data for individual locations in the South Delta and elsewhere. Adequate environmental analysis can only occur once an accurate water quality model is available.

4. The Draft EIR/EIS uses a Delta hydrodynamic and salinity model to simulate historical water quality conditions that fails to adequately simulate water quality at the Rock Slough intake to the Contra Costa Canal. The data presented in *Figure 3C-13* shows substantial disagreement between simulated and measured data using the RMA model, particularly during drought periods with seawater intrusion. The DeltaDWQ model also fails to adequately model Rock Slough chlorides, in particular during periods of agricultural drainage. C9-13

The analyses need to use a validated Delta hydrodynamic and salinity model such as the Fischer Delta Model to more accurately simulate the historical, existing and with Project conditions in the Delta. Without these corrections, an adequate environmental analysis cannot be done.

5. The methodology used in the Draft EIR/EIS to simulate water quality at western Delta and export pumps does not account for the time lag between salinity changes at these locations. The time lag between Jersey Point and Rock Slough for measured data, for example, is about 14 days, whereas the equations used in the Draft EIR/EIS (*pages B2-13* and *B2-14*) produce simultaneous salinity changes at these two locations. C9-14

The proponents should compare their EC relationships with those developed by CCWD (discussed on *page B2-9*) and measured EC data to determine what adjustments should be made to ensure that the time lags in salinity response at different Delta locations are modeled correctly. These adjustments may lead to

significant changes in project operations and environmental impacts which are different from those described in the current Draft EIR/EIS. C9-14 cont'd

6. The analysis of the impacts of the Delta Wetlands Project on THM formation potential and impacts on total organic compounds (TOC) are underestimated with respect to the proposed Disinfectants-Disinfection By-Products Rule (D/DBP Rule) standards. The impact of the project needs to be assessed relative to the 80 μg/l TTHM MCL that takes effect in June 1996 and the 40 μg/l MCL that may take effect within a few years.

   In addition, the D/DBP Rule imposes MCLs for five specified haloacetic acids (HAA), and requires pre-treatment (enhanced coagulation) when the TOC concentration in source water is above 2 mg/l. Phase I of the D/DBP rule will also impose MCLs of 10 μg/l for bromate. All these standards have not been discussed or examined in the Draft EIR/EIS. The implications of these new regulations must be examined in detail in the Draft EIR/EIS. C9-15

   The project proponents need to examine the DW Project's THM, HAA, TOC, and other D/DBP precursor impacts in the context of these reasonably foreseeable regulations.

7. The Draft EIR/EIS uses an older version of the Malcolm-Pirnie water treatment plant model to analyze THM production from Delta water. A new set of equations was designed to compensate for the high bromide concentrations in Delta water (*page C5-6*). The project proponents need to compare the results of the old model with the new model to test the validity of the assumption that recent model improvements are not expected to change the impact assessment results (see *page C5-6*). C9-16

8. The thresholds for chloride concentration changes at drinking water intakes is set too high (*Mitigation Measure C-4*) and will lead to unacceptable harm to the District's customers and to the operations of the Los Vaqueros project. The 90% of standard and 20% change criteria will still lead to significant and unacceptable impacts on water quality and water supply. For example, a 20% change in a chloride concentration of 250 mg/l corresponds to a 50 mg/l increase. Any identifiable increase in salinity or degradation of water quality in the Delta should be considered significant and mitigation measures proposed. C9-17

9. The Draft EIR/EIS uses analyses which do not accurately reflect the likely mitigated operations of the project. The differences between the environmental impacts of the proposed and mitigated projects are likely to be significant. C9-18

10. The Draft EIR/EIS fails to identify willing buyer(s) for project water and, therefore, fails to adequately assess the cumulative environmental and economic impacts of the use of water from the project. C9-19

IV. IMPACTS OF THE DELTA WETLANDS PROJECT

The District has identified a number of significant impacts of the Delta Wetlands Project on CCWD's water supply and water quality. These impacts can be classified as (a) impacts caused by DW diversions, (b) impacts caused by discharges from DW islands, and (c) other impacts.

In some cases, the Draft EIR/EIS identifies mitigation measures to avoid or reduce these impacts. However, these mitigation measures are not fully detailed and both the operation and the environmental impacts of the DW Project with these mitigation measures is not presented in the Draft EIR/EIS. Because of the lack of sufficient information regarding the mitigated project operations and the environmental impacts thereof, a new or supplemental Draft EIR/EIS may need to be prepared and circulated for additional review and comment. The following is a description of significant impacts of the DW Project on the District along with suggestions for mitigating these impacts: C9-20

A. Impacts of Delta Wetland Diversions

1. The Delta Wetlands Project will increase the salinity at CCWD's Delta drinking water intakes by significantly reducing Delta outflow. Under Alternatives 1 and 2, the maximum diversion rate to the two reservoir islands, Webb Tract and Bacon Island, could be as high as 9,000 cfs for up to 14 days. The operations studies reported in the Draft EIR/EIS suggest that these pumps might be turned on when the Delta outflow is as low as 10,000 cfs, resulting in a significant intrusion of ocean-derived salts. *Figure 3C-18*, for example, shows increases in chloride concentrations at the export pumps of up to 57 mg/l (October 1978, *Table B2-2*). This will cause unacceptable adverse impacts on the District's municipal and industrial water supply and the District's customers. It will also significantly impair the operation and degrade the performance of the Los Vaqueros Project by reducing the availability of good quality water for filling the Los Vaqueros Reservoir, and increasing the amount of stored water needed to blend Delta water to 65 mg/l chlorides or 50 mg/l sodium to meet the District's water quality goals. C9-21

For these reasons, it is insufficient for DW to propose mitigation that allows increases in chloride concentrations of up to 20% of the applicable objectives (*Mitigation Measure C-4* on *page 3C-27*). In the case of the 250 mg/l M&I standard at Rock Slough, this is equivalent to a change of 50 mg/l. A change in chloride concentration of 50 mg/l is an unacceptable degradation of the quality of the District's supply and meeting this criterion would not reduce the impact of the Delta Wetlands Project to a less-than-significant level (as stated on *page 3C-27* under *Impact C-4*).

The Delta Wetlands project must adopt acceptable mitigation measures to avoid these significant impacts. For example, these could include allowing Delta Wetlands diversions to storage only if: (1) the 2 ppt isohaline is beyond a given location west of Chipps Island, and (2) a sufficiently protective salinity level at an interior location such as Jersey Point has been met for at least 7 days and continues to be met while water is diverted by DW. These requirements could be expressed in terms of specific conductance at Chipps Island and Jersey Point, and might be consistent with Delta outflows in excess of 20,000 cfs. Similarly, the combined pumping rate on to the reservoir islands could be limited to less than 9,000 cfs or even below 4,000 cfs, or allowable diversions could be a function of outflow. An additional and separate mitigation measure might require that a percentage of all Delta Wetlands discharges be used to increase Delta outflow over that required under the May 1995 WQCP. Such measures need technical and environmental impact analysis. **C9-21 cont'd**

2. The DW Project may divert water from the Delta during fish-sensitive periods when other water agencies such as CCWD are foregoing some or all diversions or otherwise altering their operations to provide fisheries benefits. The operations studies in the Draft EIR/EIS show Delta Wetlands monthly-averaged diversions in the March through May period at as high as 3,800 cfs (*Table A3-7a*). During this period, other Delta and tributary diversions are restricted for the protection of fisheries resources. For example, CCWD (operating under its Los Vaqueros water rights permits) will be required to cease all diversions for 30 days where possible during the March-May period, and use stored water from Los Vaqueros Reservoir to meet demand. The District is also restricted from filling the Los Vaqueros reservoir during the period March 15 through May 31. The Los Vaqueros Project biological opinions also restrict filling the Los Vaqueros Reservoir in certain months to periods when the 2 ppt isohaline is west of Chipps Island and Collinsville. The Delta Wetlands Project, as the most junior appropriator, should be required to restrict all diversions during periods when other water users are restricted from diverting, or are required to change their operations for the protection of biological resources. Delta Wetlands operations which detract from or reduce the fisheries and environmental benefits derived from limits on the operations of others must be avoided. **C9-22**

The project proponents, as the most junior appropriator, should mitigate for these impacts by applying limits on Delta Wetlands diversions that are at least as restrictive as those imposed on other projects. Given the degraded condition of the biological resources of the Delta, the Project should be required to provide a net benefit to these resources. C9-22 cont'd

3. The Delta Wetlands project may divert fish flows and other public trust flows released by other water agencies, for example the April 15 - May 15 pulse flows required under the May 1995 Water Quality Control Plan. C9-23

   The project proponents should propose mitigation and do the necessary environmental impact analysis to avoid these significant impacts, for example, by limiting Delta Wetlands diversions when other agencies are making public trust releases related to fish passage to and through the Delta.

4. The Delta Wetlands project may cause significant fisheries impacts by changing flow patterns in the western Delta, by changing the salinity cues that are believed to direct fish passage through the Delta, and by actual taking of fish through losses at diversion points and predation losses in the reservoirs and in the channels. Any impacts on fish abundance by Delta Wetlands could lead to more restrictive limits on the diversions of other water users (including the District), thereby reducing its available water supply. C9-24

   The project proponents should propose actions that mitigate these impacts, e.g. monitoring and fish transfer operations if found necessary. Such actions need to include environmental analysis.

B. Impacts of Delta Wetland Discharges

1. Storage of water on peat islands for extended periods of time will likely result in increased concentrations of organic carbon, algae, salinity and other contaminants. Normal release of this water by DW could have unacceptable adverse effects on municipal water supplies, e.g. by causing increased production of trihalomethanes and haloacetic acids during the water treatment process. This impact must be avoided to assure that the statement on *page 2-1* that "the DW project would increase the availability of high-quality water in the Delta for export" is valid. C9-25

   Water treatment or other means that ensure that increased concentrations do not significantly impact water utilities should be proposed, and the ability of the project to carry out the mitigation measures should be addressed (including analysis of

environmental impacts). The Draft EIR/EIS needs to give more details of the procedures to limit discharges as needed (*Mitigation Measure C-7* on *page 3C-30*). These water quality impacts could also be mitigated by using islands with mineral soils rather than peat soil to store water. C9-25 cont'd

2. There will be times when the salinity of the discharge from Delta Wetlands islands would exceed that of the receiving water. This will also degrade the District's Delta water supply. Although the District recognizes that there will also be times when the salinity of the discharges may be lower than the receiving water, the negative impacts of Delta Wetlands discharges may not in all cases be fully mitigated by these improvements. The negative impacts need to be analyzed and should be avoided or mitigated. Given the current degraded state of the Delta, the project should only proceed if it can provide a net benefit to water quality.

   The Delta Wetlands Project should propose mitigation measures to avoid these impacts. For example, these could include (a) allowing Delta Wetlands diversions to storage only if the 2 ppt isohaline is beyond a given location west of Chipps Island, and (b) providing for a sufficiently protective salinity level at an interior location such as Jersey Point to be met for at least 7 days and to continue to be met while water is diverted by DW. These requirements could be expressed in terms of specific conductance at Chipps Island and Jersey Point, and might be consistent with Delta outflows in excess of 20,000 cfs. This mitigation measure will help ensure that only low salinity water is diverted onto the reservoir islands. C9-26

   Additionally, diversions could be limited to periods when the salinity was below a given threshold and discharges could be limited to periods when the discharge salinity is no more than a given amount above the salinity in the neighboring Delta channels.

3. Discharges from Delta Wetlands islands into shallow channels, e.g. Santa Fe Cut, could cause scouring and increased turbidity in water diverted at Delta water supply intakes. These environmental impacts need analysis. C9-27

   This impact should be avoided, for example, by limiting the discharge velocity and relocating discharge points to deeper channels away from affected water supply intakes.

4. The Draft EIR/EIS should also analyze an alternative that terminates or limits agricultural drainage from Delta Wetlands islands. This alternative would help downstream municipal water facilities in meeting future drinking water standards. This alternative would be a No Project-No Intensive Agriculture alternative and could C9-28

be compared against other Delta Wetlands Project alternatives, including the No Project-Intensive Agriculture Alternative. C9-28 cont'd

5. The project proponents should include an alternative that mitigates the impacts of Delta Wetlands discharges by providing a direct connection between the reservoir islands and the identified export locations. This would avoid water quality impacts to Delta users. From water quality considerations, islands with mineral soils would be preferable to peat soil islands. C9-29

C. Other Impacts

1. The District is concerned about any possible contamination from DW recreational boating facilities reaching its water supply intakes (*page C6-12*). Contamination could result from inappropriate fueling and waste discharges in violation of current laws, boat maintenance and repair facilities and activities (i.e. paint and heavy metal discharges into the public water supply) and accidents (e.g. boating and vehicles on congested roads causing fuel and lubricants to enter the water supply). The Draft EIR/EIS needs to detail appropriate safeguards that will be implemented to protect the District's water supplies from accidental spills and contamination from on-island marinas, as well as a notification procedure to CCWD with appropriate emergency cleanup mitigation should an accident occur. Details regarding sanitary disposal and pumpout facilities and how use of these facilities will be enforced need to be included. The Delta Protection Commission Resource Management Plan guidelines for marinas should be strictly adhered to. C9-30

2. The Delta Wetlands Project Draft EIR/EIS needs to address the cumulative effects of DWR's proposed Interim South Delta Plan and a fully mitigated Delta Wetlands Project on the District's water quality and water supply. C9-31

3. The effect of wind mixing in the water stored on Delta islands will lead to serious water quality problems if not addressed. Wind generated waves will lead to increased turbidity and can lead to serious water quality degradation when chemicals in the soil are suspended or enabled to migrate into the water column because of mixing. The water quality problems of this sort have been ignored in the Draft EIR/EIS and could lead to serious problems for biological resources in Delta channels as well as municipal and industrial uses of Delta water. The project proponents must address this potential impact. C9-32

4. The analysis of fisheries impacts in the Draft EIR/EIS includes an evaluation of the effects of variations in QWEST caused by DW diversions (*page 3F-19*). The Draft EIR/EIS notes that QWEST criteria are not included in the 1995 WQCP. The District believes that there is no scientific basis for the use of QWEST as a regulatory parameter or as an indicator of fisheries habitat conditions in the Bay-Delta. In particular, survival of coded-wire tagged fish released at Ryde on the Sacramento River below the Delta cross-channel by the USFWS shows no scientifically valid correlation with QWEST. C9-33

V. DEFICIENCIES IN THE ANALYSIS AND SCOPE OF THE DRAFT EIR/EIS

The Draft EIR/EIS fails to identify and discuss significant environmental effects of the proposed project. A Draft EIR/EIS must identify and focus on the possible significant environmental impacts of a proposed project. (Pub. Res. Code § 21000(a); Title 14, Cal. Code Regs. ("Guidelines") § 15126.) The analysis should clearly identify both direct and indirect impacts, as they occur both in the short-term and the long-term. "While foreseeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can." (Guidelines § 15144.) The Draft EIR/EIS for the DW project fails to meet these requirements.

A. Unavoidable Significant Impacts

An EIR must identify any significant impacts that cannot be avoided if the project is implemented, including those that can be mitigated but not reduced to a level of insignificance. (Pub. Res. Code § 21100(b); Guidelines § 15126(b)). Where the only means of avoiding such impacts would be to impose an alternative design on a proposed project, but the lead agency nevertheless decides not to require such design changes, the EIR must describe the implications of impacts involved and the agency's reasons for choosing to tolerate them rather than requiring the alternative design. (Guidelines § 15126(b); Pub. Res. Code § 21000(b)). The Draft EIR/EIS fails to meet these requirements in the following respects:

1. When surplus flows in the Delta are available, the DW Alternatives 1 and 2 propose to divert up to 9,000 cfs (18 TAF/day), with a maximum of 238,000 acre-feet, to two Delta islands. This could occur at any time of the year. The magnitude of the diversions would significantly reduce Delta outflows to San Francisco Bay during DW's diversion periods. Reductions in Delta outflow of this magnitude would lead to increased salinity in the Delta. DW diversions C9-34

could occur during the same time window as to be used by CCWD to divert surplus water to fill Los Vaqueros Reservoir. CCWD will divert available water to storage in the Los Vaqueros Reservoir whenever chloride levels are less than 50 mg/l. DW diversions could reduce or eliminate the diversion window for pumping to Los Vaqueros Reservoir by increasing chloride concentrations above 50 mg/l. *Figure 3C-12* shows increases in chlorides in the south Delta of up to 57 mg/l in some months. Delta Wetlands' significant impacts on the District's Los Vaqueros Project are not addressed. The District's prior comments and responses to project proponents have made clear that this must be addressed if the EIR/EIS is to be considered adequate. C9-34 cont'd

2. The degradation of the quality of CCWD's water supply by the DW project will, at the proposed thresholds for mitigation measures, impair the beneficial uses to which the water is put by CCWD's customers. The degradation causes unacceptable adverse effects on municipal water supplies. C9-35

3. Even though the water rights for the Los Vaqueros Reservoir will have a higher priority than the water rights for DW's proposed project, during some years DW diversions could reduce the amount of surplus flow available for diversion to Los Vaqueros Reservoir if DW's operations are not coordinated with the CVP, SWP, and CCWD. Real-time coordination of diversions would be difficult. The EIR/EIS does not contain an adequate discussion of how the various projects would be coordinated. C9-36

4. DW proposes to discharge up to 6,000 cfs (12 TAF/day) from the DW islands throughout the year. The water discharged from DW islands would degrade water quality at CCWD's Rock Slough intake, Mallard Slough intake, the City of Antioch's intake, and the Delta intake for the Los Vaqueros Project (presently under construction). These impacts have not been addressed in the Draft EIR/EIS. C9-37

   (a) Some DW discharges would be high in salinity because, unlike the Los Vaqueros Reservoir, DW does not have limits on the salinity of water diverted to the islands. DW would divert to fill the islands whenever surplus water is available under DW's water rights, regardless of salinity levels. Salinity in DW reservoirs may further increase due to evaporation, especially when the water is stored for a prolonged period of time. High salinity water discharged from DW islands would increase salinity concentrations in the Delta channels and at CCWD's existing and future Delta diversion locations. This would degrade Los C9-38

Vaqueros Reservoir performance, degrade the quality of CCWD's water supply, cause unacceptable adverse impacts on CCWD's municipal and industrial customers and impair the beneficial uses to which the water is put. C9-38 cont'd

(b) The trihalomethane formation potential (THMFP) of water discharged from DW islands would be significantly higher than water in Delta channels. This would result in significant increases in THM precursors and other D/DBP in CCWD diversions when DW is discharging. This would increase water treatment costs for CCWD and could make it difficult to meet future D/DBP regulations, and may even cause exceedance of limits at times. It would cause unacceptable adverse impacts on municipal water supplies, especially those of CCWD and its customers. The impacts on CCWD have not been analyzed. C9-39

(c) Algae levels in DW discharges would be greater than levels in Delta channels and could result in increased water treatment costs for CCWD and potential taste and odor problems. If chlorine is used to control algae, then THMs could increase. This would impair the beneficial uses of CCWD's water supply and cause unacceptable adverse effects on municipal supplies, especially on CCWD and its customers. C9-40

(d) DW discharges could include pollutants from pesticides, herbicides, or other agricultural residues from intensive agricultural uses over the last 40-60 years. Waste disposal sites on the islands could also contribute to pollutants in the DW discharges. DW discharges could contribute to pollutants in CCWD diversions which could increase treatment costs and impact compliance with drinking water standards. These are unacceptable impacts on municipal water supplies. C9-41

(e) The microbiological counts would be higher in the DW discharge than in the Delta channels due to waterfowl and other wildlife. C9-42

(f) Proposed discharge pump stations on Holland Tract and Bacon Island are located where they may have significant effects of CCWD's Rock Slough intake and the new intake on Old River near Highway 4 due to their proximity. C9-43

(g) Relatively high rates of diversions from and discharges to the Delta channels could increase turbidities at CCWD's intakes. This could C9-44

increase treatment costs and impair the beneficial uses of CCWD's water supply. C9-44 cont'd

(h) The effect of wind mixing in the water stored on Delta islands will lead to serious water quality problems if not addressed. As discussed in section IV.C.3 above, wind generated mixing could lead to serious problems for biological resources in Delta channels as well as municipal and industrial uses of Delta water. The project proponents must address this potential impact. C9-45

5. Higher salinity in the San Joaquin River caused by the DW project may cause increases in industrial diversions from Contra Costa Canal. C9-46

6. Higher salinity in the San Joaquin River caused by the DW project may require CCWD to reduce pumping at its Mallard Slough intake, which has a senior water right. It may also cause the City of Antioch to reduce diversions under its water rights. These impacts have substantial cost implications. C9-47

7. Sanitary waste disposal facilities on the four islands need to be designed and operated to high standards. C9-48

8. Design and construction methods used for strengthening island levees need to be carefully evaluated to ensure that levee failures do not occur during or after construction. Levee failure could have significant adverse impacts on CCWD and operations of the Los Vaqueros Project. Construction methods should be such that turbidities in water diverted by CCWD are not increased. C9-49

9. No assessment of the environmental impact of the use of Delta Wetlands Project water yield has been provided. C9-50

B. Long-term risks to health and safety.

A joint EIR/EIS must describe the long-term effects of the proposed project, giving special attention to impacts which pose long-term risks to health or safety. The reasons that the proposed project is believed by the sponsor to be justified for immediate implementation should be explained. (Guidelines § 15126(e)).

The Draft EIR/EIS does not adequately discuss the long-term health effects of increased THMFP in drinking water supplies. Nor does it explain the reasons why C9-51

immediate implementation of the project is justified in light of such health risks. How a 20 μg/l increase in TTHM relative to the anticipated future standard of 40 μg/l could be considered acceptable needs to be fully explained. C9-51 cont'd

C. Significant cumulative impacts.

An EIR must identify and discuss significant cumulative impacts. (Guidelines § 15130(a). Cumulative impacts are those that are "individually limited but cumulatively considerable." (Pub. Res. Code § 21083(b)). The cumulative impact analysis must contain three elements. First, it must identify related projects through the use of either a project list or a projection approach. (Guidelines § 15130(b)(1)). Second, it must contain a summary of the expected environmental effects to be produced by related projects. (Guidelines § 15130(b)(2)). Finally, it must contain a reasonable analysis of the cumulative impacts of the related projects and an examination of reasonable options for mitigation measures for a proposed project. (Guidelines § 15130(b)(3)).

The Draft EIR/EIS does not adequately discuss the cumulative impacts of the proposed project in combination with other reasonably foreseeable projects in the Delta, particularly the Los Vaqueros Project. An expanded analysis of how the proposed project would be coordinated operationally with the Los Vaqueros Project is required, as well as an analysis of the environmental impacts of such operations. Salinity increases at the District's intakes should be examined in conjunction with impacts from other proposed projects (e.g. the South Delta Water Management Plan) which may also cause elevated salinity in parts of the Delta. C9-52

D. Significant economic and social effects.

While economic and social effects are not considered environmental effects under CEQA, an EIR must identify and discuss economic and social effects when such effects will ultimately result in physical changes. (Guidelines § 15131(a)). The intermediate economic or social changes need not be analyzed in any greater detail than necessary to trace the chain of cause and effect.

The EIR/EIS fails to adequately consider the effects on Delta communities of removing the DW islands from agricultural production. C9-53

E. The EIR/EIS fails to adopt legally adequate mitigation measures.

An EIR must identify mitigation measures that could minimize each significant environmental effect. (Guidelines § 15126(c)). Where several mitigation measures are available, each should be discussed and the basis for selection of a particular measure identified. (Id.).

The Draft EIR/EIS fails to identify mitigation measures adequate to minimize the significant impacts of the project on Delta water quality, as discussed above. The Draft EIR/EIS should contain a detailed mitigation plan to ensure that the operations and discharges from DW Project islands do not significantly affect concentrations of organics and potential contaminants in ambient Delta channels or at the Delta intakes and export pumps, and that the operations and discharges from the DW project do not impair beneficial uses of the water, injure lawful users of water, or cause unacceptable adverse impacts on municipal water supplies or other beneficial uses. C9-54

F. The Draft EIR/EIS fails to describe and analyze a sufficient range of alternatives to the proposed project and to proposed project operations.

One of an EIR's major functions is to ensure that public agencies thoroughly assess all reasonable alternatives to proposed projects. (Laurel Heights Improvement Ass'n v. Regents of University of California (1988) 47 Cal.3d 376, 400). Consequently, an EIR must describe a range of reasonable alternatives to the project or project location, and must evaluate the comparative merits of the alternatives. (Guidelines § 15126(d)). The discussion of alternatives must focus on alternatives capable of eliminating significant environmental impacts, or reducing them to a less-than-significant level, even if the alternatives are more costly or would impede attainment of project objectives. (Guidelines § 15126(d)(3)). If an EIR concludes that no feasible alternatives to a proposed project exist, the EIR must also discuss the rejected alternatives and the reasons for their rejection in sufficient detail to allow meaningful public review. (Laurel Heights, 47 Cal.3d at 403-406). Reasonable alternatives to the project location, as well as to the project, must also be discussed. (Guidelines § 15126(d); Laurel Heights, 47 Cal.3d at 403).

The purpose of the DW Project, as modeled in the Draft EIR/EIS, is to capture surplus flows for release for export to SWP and CVP facilities. Conventional offstream storage reservoirs could achieve this purpose more efficiently. Compared to conventional offstream storage projects, the DW Project has high evaporation losses due in part to the relatively shallow reservoirs with large surface areas. C9-55

The Delta Wetlands Project Draft EIR/EIS ignores alternatives that are reasonable that divert water at rates dependent upon water availability, and schedule diversions and releases that would reduce or eliminate impacts. These alternatives and their respective environmental impacts must be examined, particularly since no willing buyers have been identified and the operations studies assume that all of the water intended to be sold would be exported at the State and Federal projects. **C9-55 cont'd**

In summary, the Draft EIR/EIS is deficient in numerous respects. The Draft EIR/EIS is legally required to contain a detailed mitigation plan to ensure that the project does not significantly affect Delta water quality; that it does not impair the beneficial uses to which the water is put; that it does not adversely affect the users of the water supplied by CCWD; that it does not cause unacceptable adverse impacts on municipal and industrial water supplies; that it does not conflict with the operations of the Los Vaqueros Project; and that it would not harm endangered and threatened species. Because of these significant impacts and the lack of sufficient information regarding the mitigated project operations, a new or supplemental Draft EIR/EIS may need to be prepared and circulated for additional review and comment. **C9-56**

Contra Costa Water District

C9-1. This comment summarizes several concerns:

effects on beneficial uses of CCWD water;

increased salinity at CCWD intakes;

elevated levels of DOC, algae, salts, and possibly other contaminants in Delta Wetlands discharges; and

the impairment of Los Vaqueros Project operations.

These concerns are addressed in responses to specific comments that follow.

Because of continuing disagreement among experts expressed in comments on the 1995 DEIR/EIS and at the 1997 water right hearing, some elements of the evaluation of Delta Wetlands Project impacts on water quality were addressed again in the 2000 REIR/EIS. The evaluation considered the effects of project operations as constrained by the FOC and biological opinion RPMs. The 2000 REIR/EIS incorporated the following:

the most recent DWR data on Delta water quality constituents,

DOC loading estimates derived from testimony and DWR's SMARTS experiments, and

updated information on the assumed relationship between constituents in raw water and municipal water treatment plant operations.

See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for information about the analysis of DOC and THMs.

Incorporating the FOC into the proposed project reduced most project effects on salinity to a less-than-significant level. Like the 1995 DEIR/EIS impact analysis, however, the analysis in the 2000 REIR/EIS found that project operations could sometimes result in significant impacts on salinity and concentrations of DOC and THMs. Therefore, the mitigation that was recommended in the 1995 DEIR/EIS was recommended again in the 2000 REIR/EIS: monitoring water quality parameters in Delta channels, on the Delta Wetlands Project islands, and at the export locations, and adjusting project diversions or discharges as needed to prevent significant changes in the measured parameters attributable to project operations.

For example, implementing Mitigation Measure C-4 would involve restricting project diversions or discharges to limit concentrations of chloride in Delta exports, including CCWD Delta diversions. This measure recommends obtaining daily measurements of

chloride concentrations from CCWD's Rock Slough and Old River intakes and calculating the change in concentration attributable to scheduled Delta Wetlands diversions. It also recommends measuring the chloride concentration in water stored on the project islands to calculate the concentration that could be expected in Delta exports if Delta Wetlands discharged water at its maximum rate. Discharges would be limited if necessary to avoid a violation of the significance criteria.

If excessive leaching of DOC or buildup of other contaminants were to occur, implementing Mitigation Measure C-5 would involve reducing the discharges to allow sufficient dilution in the Delta channels. Chapter 4 of the 2000 REIR/EIS, in the section entitled "Example of Discharge of Delta Wetlands Storage Water with High Dissolved Organic Carbon Concentrations under Mitigation Recommended in the 1995 Draft EIR/EIS", provided an example of the way in which such mitigation would be applied (see Chapter 3C in Volume 1 of this FEIS).

In October 2000, Delta Wetlands and CCWD submitted a water right protest dismissal agreement to the SWRCB that addresses CCWD's remaining concerns about potential project effects on the quality of water available for diversion by CCWD and Los Vaqueros Project operations. The agreement includes several restrictions on Delta Wetlands Project diversions to limit project effects on the location of X2. It also includes the WQMP negotiated by Delta Wetlands and CUWA, which describes the measures that Delta Wetlands has agreed to implement to limit potential project effects on drinking water quality and treatment plant operations. By agreeing to implement the WQMP, Delta Wetlands has agreed to implement a comprehensive monitoring plan and restrict discharges, when necessary, to limit project effects on DOC, THMs, and other water quality variables. The protest dismissal agreement, including the WQMP, is included in the Appendix to the Responses to Comments.

C9-2. This comment summarizes the following concerns:

use of one representative export location in the water quality impact analysis,

effects on THM and TOC concentrations and assessment of impacts with respect to future THM standards,

significance levels for the analysis of water quality effects, and

adequacy of the analysis of project effects on water quality.

These concerns are addressed in responses to specific comments that follow. See Master Response 9, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for information about the analysis of DOC and THMs; see response to Comment C9-1 regarding the protest dismissal agreement that has resolved CCWD's concerns about project impacts on salinity, DOC, and THMs.

C9-3. The 2000 REIR/EIS evaluated project operations under the FOC and other requirements adopted during the ESA consultation process to mitigate project effects on biological resources. These "mitigated operations" were reported and evaluated in the 2000 REIR/EIS.

C9-4. The concern summarized in this comment—adequacy of identified mitigation—is addressed in responses to specific comments that follow. See also responses to Comments C9-1 and C9-17 regarding the protest dismissal agreement that has resolved CCWD's concerns about project impacts on salinity, DOC, and THMs.

C9-5. See Master Response 3, "Areas of End Use and Potential Growth-Inducement Effects of Delta Wetlands Water Deliveries".

C9-6. Since this comment letter was submitted, the lead agencies have concluded formal ESA consultation with DFG, NMFS, and USFWS for project effects on listed fish species and their habitats. Biological resources that could be affected by Delta Wetlands Project operations will be protected by the mitigation measures described in the 1995 DEIR/EIS; they will also be protected by the FOC and RPMs that were developed through the consultation process and described in the no-jeopardy biological opinions issued by DFG, NMFS, and USFWS. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

C9-7. Since this comment was written, the lead agencies have issued a 2000 REIR/EIS for additional review and comment. The 2000 REIR/EIS addressed project impacts on water quality and biological resources in response to this and other comments received on the 1995 DEIR/EIS. The mitigation measures presented in the NEPA and CEQA analysis are of sufficient detail to, at a minimum, describe to reviewers the steps necessary to reduce the impact to a less-than-significant level. Additional detail about mitigation and monitoring of listed fish species was developed as part of the ESA consultation process and was included in the 2000 REIR/EIS.

C9-8. Chapter 3E assesses the potential effects of Delta Wetlands' project operations on the structural integrity and maintenance requirements of transportation and utility infrastructure. Figure 3E-1 depicts the transportation and water conveyance infrastructure in the project vicinity that is assessed in this chapter. The figure was not intended to show all water conveyance and transportation infrastructure in the project region. No changes need to be made to the figure.

C9-9. Responses to Comments C9-10 through C9-19 address the specific comments in this letter on methodology and technical content of the analysis of Delta Wetlands Project effects on water quality and water supply. Since this comment was written, the lead agencies have issued a 2000 REIR/EIS for additional review and comment.

C9-10. Whereas CCWD facilities are operated as a unit of the CVP (under USBR water rights), Delta Wetlands is completely independent and would operate under junior water rights. The Delta Wetlands Project therefore was not analyzed as being integrated with the SWP and the CVP. Operations of upstream reservoirs would not change in response to independent Delta Wetlands operations. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program", regarding this issue.

C9-11. The commenter is correct that SWP and CVP exports were adjusted for the simulations of Delta Wetlands Project operations using the DeltaSOS model that are described in the 1995 DEIR/EIS. The DWRSIM estimates of SWP and CVP exports were increased to the 1995 WQCP limits without consideration of south-of-Delta demands. This method was used to show the maximum likely environmental effects from the maximum project operations that would be physically possible; the purpose of the adjustment is to fully disclose possible water quality impacts.

Additionally, for purposes of impact assessment, a "worst-case" scenario was assumed in the 1995 DEIR/EIS in which all water discharged from the project reservoir islands would be exported through the SWP and CVP; such a level of exports would have the greatest detrimental effect on water supply, hydrodynamics, water quality, and fishery resources. For some years of the DeltaSOS simulations described in the 1995 DEIR/EIS, the simulated exports and Delta Wetlands Project operations are likely to be higher and outflow is likely to be lower than they would be under actual project operations because the demand for Delta Wetlands Project water could have been overestimated.

In response to this and other comments received on the 1995 DEIR/EIS, the lead agencies directed that the analysis of project effects for the 2000 REIR/EIS include a scenario in which Delta Wetlands discharges are exported only to satisfy the delivery deficits that the DWRSIM monthly planning model simulated to exist for each year (see Table 3-10 in the 2000 REIR/EIS [Tables 3A-29 in FEIS Volume 1]). As described in Chapter 3 of the REIR/EIS, this reduced the Delta Wetlands discharges to export in a few unusually wet years and lowered the average annual project water supply potential from 139 TAF/yr to 115 TAF/yr (Tables 3-15 and 3-18 of the 2000 REIR/EIS [Tables 3A-34 and 3A-37 in FEIS Volume 1]).

C9-12. The commenter observes that export water quality differs between CCWD's Rock Slough intake and the SWP and CVP export locations. Salinity and DOC patterns in south-Delta channels are complex and cannot be precisely simulated. The purpose of the monthly modeling using DeltaSOQ is to determine when there would be differences between no-project and with-project conditions and to estimate the relative magnitude of those differences. Estimates of export water quality used in the 1995 DEIR/EIS were based on CCWD measurements of Rock Slough chloride concentrations and EC because the Rock Slough intake has the highest average salinity of the three locations. The analysis therefore probably overstates the average salinity levels at the SWP and CVP export locations by using Rock Slough to represent conditions at all export locations.

The 2000 REIR/EIS recognized the differences in water quality in south Delta channels. The differences at different intakes are illustrated in Figures 4-1, 4-4, 4-5, 4-7, and 4-9 in the 2000 REIR/EIS (Figures 3C-26, 3C-29, 3C-30, 3C-32, and 3C-34, respectively, in Chapter 3C of Volume 1 of this FEIS). Although these differences in water quality are recognized, the DeltaSOQ model uses a representative Delta export location to evaluate whether the project would adversely affect Delta export water quality. Tidal mixing in south Delta channels strongly influences water quality at south Delta intakes. Therefore, the timing and relative magnitude of effects of project diversions and discharges at each location in the south Delta would be similar. This is illustrated by K. T. Shum's 1997 water right hearing testimony presented in CUWA Exhibit 8, as described below.

As documented in CUWA Exhibit 8, K. T. Shum used the Fischer Delta Model (FDM) to predict the difference between baseline (no-project) and with-project water quality at individual south Delta intake locations during project discharges. Shum selected August 1928 conditions for the simulation, and reported that "the combination of Delta inflows, exports, and Delta Wetlands releases used in this study were chosen to determine a probable 'worst case scenario'". (CUWA Exhibit 8.)

The results of the FDM simulation indicate that the timing of impacts on each intake facility differs slightly: changes in concentration are detected approximately 2–3 days later at the Rock Slough intake than at the Old River, Clifton Court, and Tracy intakes. However, the changes in water quality between the no-project and with-project conditions, reported as a percentage of the difference between the baseline (no-project) concentration and the stored water concentration, were similar: 20%–25% at the Tracy, Clifton Court, and Old River intakes and less than 20% at the Rock Slough intake.

Under the inflow, export, and Project discharge conditions of this example, the monthly simulation used in the REIR/S also predicts that Delta Wetlands Project discharges would result in an approximate change of 25%[1] at south Delta intakes. These results indicate that although there are differences in water quality at the various intake locations, the timing and relative changes in water quality resulting from the Delta Wetlands Project are well represented by the monthly modeling results.

As noted above, the purpose of the analysis is not to precisely predict water quality concentrations in the Delta; the purpose is to predict *differences* in water quality between the No-Project Alternative and proposed project alternatives. The simulations that use a representative export location meet this purpose.

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[1] Table 1 from CUWA Exhibit 8 shows that total south Delta diversions would be approximately 12,280 cfs (where CVP and SWP = 10,769 cfs, CCWD = 338 cfs, and Delta depletion in the south Delta = 1,172 cfs [assuming that 40% of total Delta depletion would occur in the south Delta]), and Delta Wetlands Project discharges would total 3,146 cfs. The resulting contribution of monthly Delta Wetlands Project discharges to total exports would be approximately 25%.

Additionally, the Delta Wetlands Project WQMP includes a requirement that Delta Wetlands perform both hydrodynamic and particle-tracking modeling to predict baseline conditions and real-time changes attributable to project operations. Attachment 3 of the WQMP details modeling assumptions to which Delta Wetlands and CUWA have agreed; these include use of the FDM Version 10 with simulations of real tides.

C9-13. The purpose of the DeltaSOQ model is to estimate EC, chloride, and DOC as a function of Delta flows, agricultural drainage, and exports so that the differences between no-project conditions and conditions under project operations can be simulated. The 2000 REIR/EIS compared the results of the simulations with historical data to confirm the reliability of the DeltaSOQ model in predicting general trends. For the analysis in the 2000 REIR/EIS, water quality conditions were simulated for 1922–1994 (73 years) based on the results of baseline water supply and operations modeling (i.e., DWRSIM results).

Figure G-4 of the 2000 REIR/EIS compared the DeltaSOQ–calculated and measured EC values at Chipps Island, Emmaton, and Jersey Point, and Figure G-6 showed a similar comparison of chloride values. Figure G-7 compared monthly grab samples of EC from the CVP Tracy and SWP Banks pumping plants. The comparison of the historical measured data with the model results shown in Figures G-4 through G-9 indicates that the model generally reproduces the observed patterns in Delta water quality for EC, chloride, and DOC at the locations of interest with established water quality objectives.

Several elements cause differences between measured historical data and simulation results. There is some variation between the simulated and measured (historical) water quality values because the model simulations used mean monthly flows and exports rather than actual daily flows, which are reflected in the measured data. DeltaSOQ uses the DAYFLOW estimates of Delta outflow to calculate EC with the "G-model" approach developed by CCWD; it is likely that some differences are the result of estimated Delta outflows.

The simulated No-Project Alternative serves as the baseline condition with which simulated Delta Wetlands Project operations are compared for impact assessment purposes. Although DeltaSOQ cannot replicate all the complex changes in water quality that occur in the Delta, the DeltaSOQ results are generally confirmed by the historical measurements of EC and chloride.

See also response to Comment C9-12 above regarding use of the FDM during project operations.

C9-14. CCWD observed a time lag of approximately 14 days in salinity changes between Jersey Point and Rock Slough. The NEPA and CEQA impact analysis was based on monthly average values, however. Although the 14-day lag is not simulated, the magnitude of the salinity changes is represented accurately for the monthly average conditions used in the impact assessment of water quality effects. See also responses to Comments C9-12 and C9-13.

C9-15. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

C9-16. See Master Response 7, "Analysis of Delta Wetlands Project Effects on Disinfection Byproducts", and response to Comment B7-31.

C9-17. See Master Response 6, "Significance Criteria Used for the Water Quality Impact Analysis", for a discussion of the significance criteria used in the 1995 DEIR/EIS and the 2000 REIR/EIS.

The FOC terms provide substantial protection for salinity at Chipps Island, Jersey Point, and Emmaton by requiring that X2 position be at or downstream of Chipps Island before Delta Wetlands begins diversions to storage. Chapter 4 of the 2000 REIR/EIS (see FEIS Volume 1, Chapter 3C) evaluated the effects that project operations under the FOC would have on salinity. Based on this evaluation, salinity at Chipps Island and in Delta exports was considered less than significant; salinity at Emmaton and Jersey Point was still considered significant and mitigation was recommended.

The Delta Wetlands Project WQMP provides for additional monitoring, modeling, and operational controls by Delta Wetlands to further reduce effects on salinity and DOC concentrations. The WQMP includes screening criteria intended to minimize salinity impacts associated with project discharges. Delta Wetlands would be required to modify project operations when they cause one of the following conditions, calculated as a 14-day average or the average for the duration of the discharge (whichever time period is shorter):

an increase in salinity of more than 10 mg/l chloride at one or more of the urban intakes; or

a salinity increase at the urban intakes in the Delta that exceeds 90% of an adopted salinity standard.

The WQMP also requires that Delta Wetlands implement additional mitigation of long-term water quality impacts if project operations cause a net increase in TDS, bromide, and chloride in water diverted from the Delta for urban uses, averaged over 3 years, that is greater than 5%.

Additional project restrictions were included in the protest dismissal agreement between Delta Wetlands and CCWD. These restrictions further reduce potential project effects on salinity and include restrictions on Delta Wetlands diversions as a function of X2 location. These restrictions are summarized in the following table. Refer to the Appendix to the Responses to Comments for the full text of the protest dismissal agreement.

Summary of Delta Wetlands and Contra Costa Water District
Protest Dismissal Agreement Terms

3a. Project diversions shall not exceed 1,000 cfs when the 14-day running average X2 is greater than 80 km, nor exceed 500 cfs if the 14-day running average X2 exceeds 81 km.

3b. Project diversions shall not exceed 25% of net Delta outflow year-round or 15% of net Delta outflow in January, February, and March.

No project diversions shall be made in April and May.

Project diversions shall not shift the location of X2 by more than 2.5 km during the October-through-March period.

3c. The Delta Wetlands Project shall not cause an increase in chloride concentration at any of CCWD's intakes of more than 10 mg/l at any time.

3d. Project diversions cannot begin until X2 has been west of Chipps Island for a period of 10 consecutive days for the current water year.

4. Project diversions shall not cause the location of the 14-day running average of X2 to shift upstream such that X2 is:

east of Chipps Island (i.e., >75 km) during February through May;

east of Collinsville (i.e., >81 km) during January, July, and August; or

east of Collinsville (i.e., >81 km) during December, and delta smelt are present at CCWD's point of diversion.

C9-18. See response to Comment C9-3.

C9-19. See Master Response 3, "Areas of End Use and Potential Growth-Inducement Effects of Delta Wetlands Water Deliveries".

C9-20. See responses to Comments C9-3 and C9-7.

C9-21. Several of the mitigation measures proposed by the commenter have been incorporated into the FOC. The FOC include outflow criteria that would reduce Delta Wetlands effects on X2, EC, and chloride concentrations; see response to Comment C9-17. Incorporating the FOC into the proposed project eliminated the simulated diversions for October 1978 shown in the 1995 DEIR/EIS assessment (referred to in the comment); see Table 3-13 of the 2000 REIR/EIS (Table 3A-32 in Chapter 3A of FEIS Volume 1). The commenter's suggested outflow of 20,000 cfs would provide a very large measure of protection; this outflow would correspond to a chloride concentration of approximately 1 mg/l from seawater intrusion at the CCWD intake. Delta outflow requirements somewhat less than the suggested 20,000 cfs have been incorporated into the FOC. See response to Comment C9-22.

Possible interference with Los Vaqueros Project operations has been eliminated by adoption of the protest dismissal agreement between CCWD and Delta Wetlands. See responses to Comments C9-17 and C9-22.

C9-22. The FOC terms developed through the ESA consultation process and incorporated into the proposed project prohibit Delta Wetlands from diverting water during April and May and include several restrictions on diversions in March. These include restrictions based on:

- X2 location,
- change in X2,
- total surplus flow,
- total outflow, and
- presence of delta smelt.

As indicated by the commenter, the location of X2 can constrain CCWD's Los Vaqueros Project operations in some months. These FOC measures reduce Delta Wetlands' effects on X2 location.

Term 4 of the protest dismissal agreement that Delta Wetlands and CCWD submitted to the SWRCB in October 2000 includes additional restrictions on Delta Wetlands diversions to ensure that Delta Wetlands will not interfere with CCWD's ability to meet the terms of the Los Vaqueros Project biological opinions. Under the agreement, Delta Wetlands is prohibited from diverting water when CCWD's diversions to Los Vaqueros Reservoir are restricted or prohibited because of the position of X2. See the copy of the agreement in the Appendix to the Responses to Comments for details.

Implementing these measures will ensure that Delta Wetlands Project operations do not affect X2 when CCWD must restrict operations to protect fisheries. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for a description of the FOC terms.

C9-23. See responses to Comments C6-7 and C9-22.

C9-24. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

C9-25. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for information about the analysis of DOC and THMs.

C9-26. The impact assessment for project effects on chloride includes the possibility that the salinity of water stored on the project reservoir islands could be greater than channel salinity. See responses to Comments C9-17 and C9-21.

C9-27. See response to Comment B5-11 regarding the potential for scour at Delta Wetlands discharge facilities. The Bacon Island discharge location has been changed since the 1995 DEIR/EIS was published. See Chapter 2 of FEIS Volume 1and response to Comment R10-37.

C9-28. The 1995 DEIR/EIS analyzes a reasonable range of alternatives that would meet the project purpose and analyzes the No-Project Alternative as required by NEPA and CEQA. The alternative proposed by the commenter would not meet the project purpose and therefore would not be considered in the reasonable range of alternatives.

C9-29. The commenter suggests that the CEQA and NEPA document analyze an alternative that includes a direct connection between the Delta Wetlands reservoir islands and the export locations. A direct connection between the Delta Wetlands reservoir islands and the export locations would only be relevant if Delta Wetlands operations were integrated into the SWP and CVP operations. Although Delta Wetlands Project operations could be integrated with operation of SWP and CVP export facilities, no proposals for such integration have been made for which the lead agencies could reasonably assess the environmental effects. For impact assessment purposes, all Delta Wetlands Project discharges are assumed to be exported; however, project discharges could also be used for environmental purposes (i.e., to augment outflow), as stated in the project purpose. Therefore, the project has been analyzed only as a stand-alone facility operated independently of the SWP and CVP, and analysis of the alternative suggested by the commenter would be unreasonably speculative regarding the future operations of the SWP and CVP. Additionally, the Section 404(b)(1) Alternatives Analysis for the Delta Wetlands Project discusses the use of other Delta islands for reservoir storage; see Appendix 4 of the 1995 DEIR/EIS.

C9-30. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities", and response to Comment B5-9.

C9-31. The scenario for the cumulative impact analysis described in Chapter 3C of the 1995 DEIR/EIS and Chapter 3 of the 2000 REIR/EIS included the proposed DWR South Delta Program. Refer to Chapter 3A and 3C of FEIS Volume 1. See also response to Comment B7-3.

C9-32. Chapter 3C (page 3C-30) of the 1995 DEIR/EIS described water quality issues related to wind mixing and increased turbidity (see page 3C-33 of FEIS Volume 1), and the chapter recommended a mitigation measure (Mitigation Measure C-7) to reduce the potential effects on channel water quality. The measure includes daily monitoring and monthly reporting of turbidity and potential contaminants and limiting discharges as necessary to limit effects of discharges on channel water quality. The FOC terms include similar requirements for temperature and DO. If high winds caused significant mixing of stored water and unacceptable turbidity or suspension of contaminants, Delta Wetlands would be required to reduce or suspend discharges until settling reduced the concentrations to acceptable levels.

C9-33. An evaluation of QWEST was included in the 1995 DEIR/EIS and in the biological assessment to meet information needs expressed by NMFS, DFG, and others. QWEST is an indicator of fish habitat conditions (e.g., an index of the volume of Sacramento River flow entering the central Delta through the lower San Joaquin River and distributary channels). As noted by the commenter, the biological significance of QWEST is not clearly supported by available information. The DFG biological opinion, however, does include an RPM limiting project diversions in March based on QWEST.

C9-34. The FOC terms limit potential project effects on X2 and outflow and, therefore, on CCWD chloride concentrations. Incorporating the FOC into the proposed project eliminates the effect referred to in the comment (an increase of 57 mg/l in chloride concentration). See responses to Comment C9-17 and C9-22.

C9-35. See response to Comment C9-1.

C9-36. Real-time coordination would probably occur through the CALFED Ops Group; see response to Comment B6-49. The WQMP also includes details of real-time monitoring and coordination that Delta Wetlands has agreed to implement.

C9-37. The potential effects of Delta Wetlands discharges on salinity in the Delta and at Delta export locations were described in Chapter 3C of the 1995 DEIR/EIS and Chapter 4 of the 2000 REIR/EIS (see Chapter 3C in Volume 1 of this FEIS). Because all water released from the project islands is assumed to be exported, the analysis did not report changes in salinity at Mallard Slough (represented in the analysis by the Chipps Island location) and the City of Antioch intake (represented by the Chipps Island and Jersey Point locations) as a result of Delta Wetlands discharges. Changes in salinity at CCWD's Rock Slough intake and the Los Vaqueros Old River intake resulting from project discharges were described in Appendix B2 and Chapter 3C of the 1995 DEIR/EIS. See responses to Comments C9-1, C9-17, and C9-22. Additional protection is provided by the FOC and WQMP measures that limit Delta Wetlands diversions when salinity is high, and thereby limit the salinity of water that would be stored on the reservoir islands and subsequently discharged. See responses to Comments C9-17 and C9-22 above.

C9-38. See responses to Comments C9-17 and C9-22 regarding restrictions on Delta Wetlands operations to minimize salinity impacts.

C9-39. The evaluation of project effects on DBPs was updated in the 2000 REIR/EIS. See Master Response 9, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for more information.

C9-40. Mitigation Measure C7 includes routine monitoring of chlorophyll. Delta Wetlands would not discharge water if algae problems existed in water stored on the reservoir islands. See response to Comment B7-50.

C9-41. The potential for the presence of pesticide residues and waste disposal remains on the reservoir islands was addressed in Appendix C6, "Assessment of Potential Water Contaminants on the Delta Wetlands Project Islands", of the 1995 DEIR/EIS. No significant residues of agricultural chemicals were detected; however, some sites of potential contamination from past agricultural operations and waste disposal operations exist on the Delta Wetlands Project islands. Therefore, Mitigation Measure C-8 was provided in Chapter 3C to address the unlikely event of the release of pollutant residues into stored water. This measure recommends that preliminary site assessments be conducted at potential contamination sites, in addition to those already performed for the impact analysis. Site cleanup or remediation would be necessary if any pollutant sources were identified.

C9-42. Avian microorganisms do not survive in water for long periods. Also, most of the increased use of the Delta Wetlands Project islands by waterfowl would take place on the habitat islands, rather than on the reservoir islands.

C9-43. The large tidal excursion (water movement) and mixing in the south Delta would result in rapid blending of project discharges with channel water. Therefore, the physical proximity of the discharge pumps to intakes is not as important as the proportion of water reaching an intake that originates in Delta Wetlands Project discharges, and the relative characteristics of that water. Appendices B1 and B2 of the 1995 DEIR/EIS evaluate the changes in Delta channel flows that could result from project operations and the relative contributions of Delta Wetlands Project discharges to export concentrations of water quality variables. The impact analysis in Chapter 3C of the 1995 DEIR/EIS and of Volume 1 of this FFEIS reflects the results of these evaluations. See also responses to Comments C9-12 and C9-27 above.

C9-44. Delta Wetlands Project operations would not cause large changes in turbidity in Delta channels. See response to Comment C9-27 above.

C9-45. See response to Comment C9-32.

C9-46. Incorporating the FOC into the proposed project substantially limited the potential effects of proposed project operations on San Joaquin River salinity. For a listing of the FOC measures that limit the effects of project operations on salinity, see "Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows, Downstream Transport, Area of Optimal Salinity Habitat, and Entrainment" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions"; see also response to Comment C9-22 above.

The analysis of potential project impacts used the basic CCWD water demand pattern as simulated by DWRSIM. Analyzing the indirect effect of potential changes in San Joaquin River salinity on demand patterns within the CCWD service area is too speculative and is beyond the scope of the CEQA and NEPA analysis.

C9-47. Delta Wetlands diversions may affect salinity at Mallard Slough and the City of Antioch intake. The 1995 DEIR/EIS and the 2000 REIR/EIS analyzed potential effects of project operations on salinity at these locations. Changes in salinity at Chipps Island reported in these documents is representative of changes at Mallard Slough. The City of Antioch intake is located between Chipps Island and Jersey Point; therefore, changes in salinity at the City of Antioch intake are bracketed by the changes reported for Chipps Island and Jersey Point. See Chapter 3C, "Water Quality", in Volume 1 of this FEIS for results of the analyses. See also response to Comment C9-37 regarding the effect of Delta Wetlands discharges on salinity at these locations.

C9-48. See responses to Comments A3-3 and B5-3 regarding the design and operation of sewage disposal and treatment facilities.

C9-49. The 2000 REIR/EIS included an analysis of the proposed levee design and construction; see Chapter 3D of FEIS Volume 1 and Appendix H of the 2000 REIR/EIS for more information. Because levee construction activities would occur on the interior of the project islands, no change in turbidity in Delta channels would occur. Additionally, for construction activities associated with installing siphon and pump facilities and recreation boat docks in channels, Delta Wetlands would be required to obtain water quality certification or a waiver of certification from the SWRCB (pursuant to Section 401 of the Clean Water Act) before construction; this certification would include guidelines for standard construction practices to minimize effects of construction on water quality.

C9-50. The Delta Wetlands Project is analyzed as a stand-alone water storage facility, operated independently of the SWP and CVP, without regard to specific entities to which the water would be sold. The environmental effects that would result when purchasers use water provided from the Delta Wetlands Project are defined as "growth-inducing" effects. See response to Comment B6-2.

C9-51. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

C9-52. The direct and indirect impacts of the project alternatives are considered in combination with the impacts of closely related past, present, or reasonably foreseeable, probable future projects. A list of related projects considered as part of the framework for analyzing cumulative impacts is included in Appendix 2 of the 1995 DEIR/EIS. These projects were given reasonable consideration for their contribution to the cumulative conditions in the Delta.

A quantitative assessment of cumulative water quality impacts was performed using DeltaSOS simulations of the Delta Wetlands Project under the assumption that SWP pumping would be permitted at full capacity of Banks Pumping Plant (see Chapter 3A of Volume 1 of this FEIS). The methodology for evaluating cumulative impacts quantitatively was based on the following scenario:

- increased upstream demands;
- increased demands south of the Delta;
- an increased permitted pumping rate at Banks Pumping Plant;
- implementation of the South Delta and North Delta Programs;
- additional storage south of the Delta in Kern Water Bank;
- operation of the Los Banos Grandes Reservoir, MWD's Diamond Valley Reservoir, and the Arvin-Edison projects; and
- operation of CCWD's Los Vaqueros Reservoir.

This list was used to develop a quantitative scenario that represents reasonably foreseeable future Delta conditions and regulatory standards.

As required by CEQA, the analysis evaluated the project's contribution to cumulative water quality conditions (State CEQA Guidelines Section 15130). Based on the water quality analyses in the 1995 DEIR/EIS and 2000 REIR/EIS, implementation of the Delta Wetlands Project under cumulative conditions would contribute to significant adverse effects on salinity (EC), DOC, THM, and other water quality variables and would require the implementation of mitigation measures. See Chapter 3C of the 1995 DEIR/EIS and Table 3C-32 in Chapter 3C of FEIS Volume 1 for more information about the significance conclusions for cumulative impacts.

Since the 2000 REIR/EIS was published, CALFED released its Final Programmatic EIS/EIR. The impact analysis in the CALFED document also concluded that the Delta Wetlands Project would contribute adversely to cumulative water quality conditions. The CALFED program's contributions to cumulative water quality impacts are expected to be avoided, reduced, or mitigated to a "less than cumulatively considerable" level, with the exception of localized increases in EC in water in the central Delta. Such increases are considered a significant unavoidable cumulative impact. (CALFED Bay-Delta Program 2000.)

A good faith effort was made to analyze the Delta Wetlands Project under cumulative conditions based on review of foreseeable projects in the Bay-Delta and a qualitative evaluation of the project's contribution to future cumulative conditions. This method is sufficient for compliance with CEQA and NEPA. Modifications to the cumulative impact assessment requested by the commenter would not change the impact conclusions. Therefore, cumulative impacts on water quality remain significant and require mitigation as reported in the environmental document.

See also response to Comment R2-6 regarding cumulative contributions of DOC from wastewater projects.

See response to Comment B6-49 regarding coordination of Delta Wetlands Project operations with Los Vaqueros Reservoir operations; such coordination would probably occur through the CALFED Ops Group.

C9-53. As discussed in Chapter 3K, "Economic Conditions and Effects", Alternatives 1, 2, and 3 would result in the loss of agricultural jobs on the Delta Wetlands Project islands. The loss of these jobs would lead to the loss of additional jobs in industries that supply goods and services to farming operations on the Delta Wetlands Project islands. Although the estimated 280 agriculture-related jobs that would be lost under Alternative 1 would be a large number of jobs, the jobs would be spread over a wide area and several communities. The loss of these jobs would affect agricultural workers who reside on the Delta Wetlands Project islands and workers who commute from nearby communities or work in the area temporarily. The secondary employment losses would be spread over several communities that include businesses dependent on agriculture. Large communities such as Lodi and Stockton and smaller communities such as Rio Vista and Brentwood could be affected.

Under Alternative 1, the estimated 280 agriculture-related jobs lost because of the project would be more than offset by the estimated 406 jobs generated within the region by the expenditures of project-related recreationists and the operation and maintenance of water storage and recreation facilities. Many of these jobs would probably be located in communities that would experience losses of agriculture-related jobs. Jobs would shift among businesses and industries within affected communities, potentially resulting in the closure of a few existing businesses and the opening of new businesses; however, the net effect on employment and income within these communities should be positive. No substantial adverse short- or long-term economic effects should be felt by communities located near the Delta Wetlands Project islands. The analysis presented in the 1995 DEIR/EIS is detailed enough to confirm that the project would not cause community-level effects that would ultimately result in adverse physical changes within communities.

C9-54. See response to Comment C9-1 regarding mitigation measures and additional detail provided in the WQMP.

C9-55. The 1995 EIR/EIS and 2000 REIR/EIS analyzed a reasonable range of alternatives that would meet the project purpose and also analyzed the No-Project Alternative as required by NEPA and CEQA. As described in Chapter 2 under "Alternatives Considered but Not Selected for Detailed Evaluation", the lead agencies considered non-Delta water storage or conjunctive use as a potential alternative. However, this alternative was eliminated from further evaluation because it would not meet the project purpose. See also the Section 404(b)(1) Alternatives Analysis presented in Appendix 4 of the 1995 DEIR/EIS.

C9-56. See response to Comment C9-7 above.

Letter C10

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December 20, 1995

Mr. Jim Sutton
State Water Resources Control Board
Division of Water Rights
Post Office Box 2000
Sacramento, California 95812-2000

SUBJECT: DRAFT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT — DELTA WETLANDS PROJECT
STATE CLEARINGHOUSE NO. 96 COMMENT
DUE DECEMBER 21, 1995

Dear Mr. Sutton:

San Joaquin County Department of Public Works has serious concerns regarding the Draft Environmental Impact Report/Environmental Impact Statement (EIR) for the proposed Delta Wetlands Project. Please consider the following, when preparing the final document, to insure adequate mitigation to minimize the significant environmental and infrastructure impacts to the surrounding islands, roadways and waterways within San Joaquin County:

I. FLOOD CONTROL/SEEPAGE

The Water Resources/Flood Control Division has serious concerns regarding the safety of the reservoir islands. The Division does not find an improvement in flood protection in the description of construction nor operational maintenance of the proposed project. Example, a levee failure on a reservoir island could have disastrous and previously unforeseen consequences. The sudden outflow of water from the 100,000 acre-feet of water stored could be vastly different from the usual Delta flood patterns of water flowing from upriver. The EIR needs to address the requisite change in flood preparedness or identify remedial measures to mitigate this added flood threat to San Joaquin County. **C10-1**

The problem of seepage or other non-catastrophic failure is another issue of concern. The levee maintenance procedures described in the EIR, such as "placement of fill", are basically the same as current levee maintenance practices. Current levees need only keep water out. The EIR should specifically address the particular needs of levees, which act to fully impound the entire perimeter of Delta islands. Water, wind, tide and time Affect both sides of any levee system. Consequently, the levees of the proposed project have an extraordinary set of tasks: to act as a mass, circular dam; to resist water from both directions, unlike most dams (levees); and to do all of this for great horizontal distances. One need only look at the condition of previous levee failures in the Delta, where a repair was not completed, for whatever reason, to see first hand what happens to levees with water lapping up, over and through on both sides. **C10-2**

Diagrams of mitigations in the EIR are contradicted elsewhere in the text of the EIR. One diagram shows a 10/1 graded, sloping "toe berm" meant to anchor the interior base of the reservoir levees. This measure seems adequate, until the EIR later explains that soil subsidence could continue and increase the reservoir's capacity by nine percent within **C10-3**

50 years. This is promoted as a benefit to the levee system in the EIR, but it ignores the fact that toe berms and other levee strengthening measures will sink along with the surrounding soil level and therefore be less effective. **C10-3 cont'd**

The EIR states that discontinuing farming will reduce subsidence and thus increase levee stability. This conclusion is unsupported. Subsidence will occur with the proposed project, as well. Agricultural use permits access and additional levee wall support. The proposed project will add water pressure along the island side of the levee and exacerbate levee erosion. **C10-4**

II. TRANSPORTATION, TRAFFIC & BRIDGE IMPACTS

The approach roads, which course through miles of peat rich farmland, are not considered in the EIR. It is anticipated that the proposed project will impose more frequent maintenance than is presently required of County maintenance crews. Mitigation of the impacts to County infrastructure after completion of the proposed project and the projected increases in recreational traffic need to be included. **C10-5**

Increased recreational use of levee and approach roads from State Highway Routes 4 and 12 may adversely impact agricultural activity adjacent to the approach roads leading to and away from the proposed project. Recreational vehicles mixed with semi-tractor/trailer traffic upon narrow levee roads may require additional road improvements to accommodate vehicle passing movements and line of sight problems at trestles and bridges.

Increased traffic upon delta waterways within the County arising out of the proposed project will accelerate deterioration of bridge improvements. Specifically, the Bacon Island Road crossing at Middle River will be impacted. Both water and vehicular traffic increases will require additional opening and closing movements of the swing span portion of Bacon Island Road Bridge. Accident statistics could be expected to increase on both water and roadways during periods of boat and vehicle queuing during bridge operations. **C10-6**

The proposed project mitigation measures are, at present, insufficient to mitigate the accelerated wear and tear on County roads and bridges serving the proposed project.

III. ECONOMIC EFFECTS

San Joaquin County is concerned with the loss of agricultural income and employment from the proposed project. Loss of tax revenue from agricultural income is a corresponding concern.

The EIR specifies that no economic conclusions are made since the California Environmental Quality Act and National Environmental Policy Act do not consider economic impacts to be environmental. In the very next paragraph, however, the EIR states that proposed project related activities will generate a net increase in employment and income. **C10-7**

The possibility of recreational activities having a much smaller economic contribution than hoped for at project build-out exists, as well. Although ambitious plans are outlined within the EIR which describe multiple, resort-like recreation facilities ringing the project islands, corresponding descriptions of who will finance and operate these facilities are murky at best. Should there be no investors, then there will be no jobs and no tax revenue.

San Joaquin County maintains that more questions regarding the economic impacts of the proposed project should be asked and satisfactorily answered.

IV. CENTRAL DELTA WATER AGENCY

San Joaquin County also supports any comments submitted by the Central Delta Water Agency.

CONCLUSION

The project proponent is asked to consider the above comments, expand and improve the quality of the analysis as necessary to mitigate roadway, levee, flood, safety and maintenance concerns of San Joaquin County Department of Public Works. If that is not possible or feasible, then please reconsider the no project alternative as appropriate mitigation to the significant infrastructure, safety and financial impacts to the citizens of San Joaquin County not discussed nor suitably mitigated in the EIR for the proposed project.

If you have any questions regarding these comments, call me at (209) 468-3073. Please notify the San Joaquin County Department of Public Works of any hearing or subsequent document regarding this proposed project or any other proposed project upstream from or adjacent to this project which San Joaquin County, the Lead Agency or project proponent may contemplate in the future.

Very truly yours,

A. J. TSCHIRKY
Real Property Agent

AJT:KH:sc
RP-5L189.S1

San Joaquin County Department of Public Works

C10-1. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents an evaluation of levee stability for the Delta Wetlands reservoir levees and of worst-case outward levee failure. Based on the results of the analysis and on mitigation measures recommended to improve the factor of safety for slope stability toward the slough, the risk of an outward levee failure during maximum reservoir operations is very small; therefore, property damage or changes in flood conditions resulting from levee failure are not foreseeable effects of the Delta Wetlands Project. Because the Delta Wetlands Project does not present a flood threat to San Joaquin County, no changes in flood preparedness are required. See Chapter 3D of FEIS Volume 1 and Appendix H of the 2000 REIR/EIS for more information.

C10-2. The commenter is referring to information or analysis in the 1995 DEIR/EIS that was replaced or augmented by the 2000 REIR/EIS. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents a new analysis of the potential seepage impacts of Delta Wetlands reservoir operations and an evaluation of the stability of the proposed levees on the reservoir islands. The analysis of levee stability evaluates wind and wave run-up on the interior of the islands and examines the effectiveness of the erosion control methods proposed by Delta Wetlands. See Chapter 3D of FEIS Volume 1 and Appendix H of the 2000 REIR/EIS for more information.

C10-3. The commenter is correct in stating that subsidence would affect the levee toe berms over time. The levee maintenance program described in the 1995 DEIR/EIS includes raising the levee crest by adding fill, placing additional erosion protection where needed, and repairing the levee as needed to compensate for settling, erosion, and subsidence. To monitor changes in the levee structure, Delta Wetlands would conduct levee profile surveys annually for the first 5 years of operation and triannually thereafter and would submit the survey results to DWR, the SWRCB, and USACE. Any changes in levee structure caused by subsidence of the island interiors would be mitigated through this monitoring and maintenance program.

C10-4. As described in Chapter 3D, subsidence in the Delta results primarily from conversion of peat soil into gas, a condition exacerbated by agricultural activity. The 1995 DEIR/EIS therefore assumes that the rate of subsidence under project conditions would be less than that under agricultural production.

Erosion of the interior slope of the levees surrounding the Delta Wetlands reservoir islands is discussed in Chapter 3D of FEIS Volume 1 and in Appendix H of the 2000 REIR/EIS. Erosion of the interior slopes would be monitored and mitigated during project operation. The inner levee system constructed on the reservoir islands would provide motorized access on the islands for levee inspections during periods of nonstorage.

C10-5. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

C10-6. See the section entitled "Roadway Safety and Maintenance" in Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

C10-7. The requirements of CEQA and NEPA regarding the economic and social effects of the project are discussed on pages 3K-1 and 3K-2 of the 1995 DEIR/EIS (page 3K-2 of FEIS Volume 1) under "Introduction". In summary, economic effects are not considered environmental impacts in and of themselves, but a project's economic effects may be discussed in the NEPA and CEQA analysis.

The potential fiscal effects of Alternative 1 are discussed on pages 3K-10 and 3K-11 of the 1995 DEIR/EIS (page 3K-14 of FEIS Volume 1) under "Fiscal Effects". Based on estimated construction costs for water storage and recreation facilities, property tax revenue generated by the project could increase by more than $1.6 million over existing revenue generated by the Delta Wetlands Project islands. Even without construction of recreation facilities, with-project property tax revenue payments would be substantially higher than existing payments. Increased regional income generated by the project by employment growth would also generate increased sales tax revenues. Increased public revenues generated by the project would be allocated among Contra Costa County and San Joaquin Counties and several special districts.

In May 2001, Delta Wetlands removed construction of recreation facilities from its CWA permit application. However, it is anticipated that Delta Wetlands would apply for permits for some or all of the recreation facilities when specific designs are developed for the facilities. Facilities would be developed over a long time period, based on demand for recreational uses. Although the economic analysis is based on full development of the recreation facilities described in the 1995 DEIR/EIS, the partial development of planned facilities would not substantially change the conclusion that the project would result in net growth in regional employment and income. As Tables 3K-5 and 3K-6 of the 1995 DEIR/EIS show, implementation of Alternative 1 would result in the net gain of 31 permanent jobs and $4.9 million in annual regional income even without the estimated employment and income generated by the operation and use of recreation facilities.

SAN JOAQUIN COUNTY
COMMUNITY DEVELOPMENT DEPARTMENT

1810 E. HAZELTON AVE., STOCKTON, CA 95205-6232
PHONE: 209/468-3121 Fax: 209/468-3163

December 20, 1995

State Water Resources Control Board
Division of Water Rights
Attn: Jim Sutton
P.O.Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers
Regulatory Branch
Attn: Jim Monroe
1325 J Street, Room 1444
Sacramento, CA 95814-2922

Re: Draft EIR/EIS for the Delta Wetlands Project, Supplemental Comments

These comments are intended to supplement our comments of 11/14/95. They specifically address State Route 12 on Bouldin Island, an island proposed for wetland development.

State Route 12 is presently a two lane highway, providing an important link from State Route 99 and Interstate 5 to Interstate 80 and the Bay Area. For some time it has been recognized that SR 12 needs to be widened. The San Joaquin County General Plan, adopted by the County in 1992, calls for the widening of SR 12 to four lanes to carry the projected 2010 traffic.

To accommodate a four lane roadway, Caltrans will need to acquire additional right-of-way. In the proposed Delta Wetland project, adequate right-of-way needs to be reserved for the eventual widening of the road. No wetland development should occur within this future right-of-way. In addition, the project should provide protection for SR 12 so that no seepage is allowed to undermine the highway. C11-1

If you have any questions regarding my comments, please contact me at (209) 468-3146.

Sincerely,

Peggy Keranen
Deputy Director

c. Manuel Lopez. Public Works
John Pulver, Public Works
David Edrosolon, Public Works
Richard Laiblin, CAO
Dana Cowell, Caltrans
Margit Aramburu, Delta Protection Commission
(with 11/14/95 comments)
6.6.03.12
DLTWET.LT2

San Joaquin County Community Development Department

C11-1. These issues have been addressed in response to Caltrans' comments on the 1995 DEIR/EIS. See responses to Comments B8-1 through B8-11 for more information.

San Joaquin County Council of Governments

Member Agencies: Cities of Escalon, Lathrop, Lodi, Manteca, Ripon, Stockton, Tracy, County of San Joaquin

December 21, 1995

Mr. Jim Monroe
U.S. Army Corps Of Engineers Regulatory Branch
1325 J Street
14th Floor
Sacramento, CA 95814-2922

Dear Mr. Monroe:

I am writing in regards to the Delta Wetlands Project environmental analysis and the Council of Governments interests. As the regional planning agency for San Joaquin County we have an interest in both habitat protection and in the safe and effective operation of the regional transportation system. Your proposal has implications for both of these issues.

1. Habitat and Open Space Protection

As the Council of Governments works through 1996 on the development of a regional plan to protect the habitat of threatened and endangered species, we will be keeping an eye on your efforts for how we can be mutually supportive. Our effort will involve the potential need to acquire through easements or outright purchases "habitat preserves" to mitigate for development proposals in our region. Your effort presents an excellent opportunity for joint cooperation.

2. Regional Transportation Systems

The San Joaquin Council of Governments, acting as the Transportation Authority for this county has allocated $1.7 million of Measure K funds to widen Highway 12 to provide for better operations of a facility that is heading for major capacity problems. This may very well involve the need to acquire right of way, or at least modify the existing road bed within the existing right of way to accommodate operational improvements. Caltrans has indicated to you and to us that your proposal, while possibly not preventing our project, will greatly constrain and impact our options. The likely outcome is a change in our project scope, and a resulting increase in project cost can be expected. We share Caltrans' concern and C12-1

Regional Transportation Planning Agency, Local Transportation Authority, Congestion Management Agency, Airport Land Use Commission

102 South San Joaquin Street, 4th Floor • P.O. Box 1010 • Stockton, California 95201-1010 • (209) 468-3913 • FAX: (209) 468-1084

interest in your proposal not abutting the right of way line so that the constraints and impacts on our project are minimized.

In the interest of good public planning and the safety and operations of a vital transportation link, I am sure you will see the benefit to the public at large and to your own interests in mitigating any impacts on our funded project. **C12-1 cont'd**

Thank you for your consideration of our interest, and I look forward to working with you in the future.

Sincerely,

ANDREW T. CHESLEY
Deputy Executive Director

cc: Peggy Keranen, San Joaquin County Planning
Dana Cowell, Caltrans District 10
Amy Augustine, San Joaquin COG - Habitat Planning

CONGESTION RELIEF PROJECTS

PROJECT: **Route 12** **10**

PROJECT SPONSOR: Caltrans

INTERESTED PARTIES: San Joaquin County, City of Lodi

PROJECT SCOPE:

Construct two passing lanes (1 each direction) near Potato Slough Bridge. The existing facility is a 2-lane rural highway.

PROJECT COST ESTIMATES* ($1993):

Pre-Project Study Report	$
Project Study Report (PSR)	$104,000
Project Report & Environmental Review	$832,000
Right-of-Way Acquisition	$
Plans, Specifications & Estimates (PSE)	$832,000
Construction	$2,730,000
Total Cost (does not include ROW)	$4,498,000

* These estimates escalated the 1992 Strategic Plan numbers.

EXPECTED REVENUE SOURCES ($1993):

Measure K	$1,781,000
Local:	
Public Facilities Fees (Developer)	$
Local Street Repair Funds (Measure K)	$
Gasoline Tax Revenues	$
Other	$
State:	
State Transportation Improvement Program	$1,781,000
State-Local Partnership	$
Environmental Enhancement Activities	$
Other (project development costs)	$936,000

CONGESTION RELIEF PROJECTS

Federal:

Surface Transportation Program	$
Congestion Mitigation & Air Quality	$
Transportation Enhancement Activities	$
Transportation System Management	$
Petroleum Violation Escrow Account	$
Other	$
Total Revenues	$4,498,000
Surplus/(Shortfall)	$0

MEASURE K ALLOCATION BY YEAR:

2005/6	2006/7	2007/8
$416,000	$683,000	$683,000

PROJECT SCHEDULE:	Start Date	Completion Date
Pre-Project Study Report:	———	———
Project Study Report:	July 2000	June 2001
Project Report & Environmental Review:	Nov. 2004	May 2005
Right-of-Way Acquisition:	Not available at this time.	
Plan, Specifications & Estimates:	Jun. 2005	Sept. 2006
Construction:	Jan. 2007	Feb. 2008

ISSUES:

- May need to increase right-of-way due to flooding concerns.
- The construction estimate provided by Caltrans lowers the cost of the project substantially. As a result, the 1992 Measure K allocation and the share of state funds should be reconsidered. However, until a decision is made, the 50% Measure K share and 50% state funding assumption will be maintained.

San Joaquin County Council of Governments

C12-1. This issue has been addressed in response to Caltrans' comments on the 1995 DEIR/EIS. See responses to Comments B8-1 through B8-11 for more information.

Letter C13

Harvey E. Bragdon
Director of Community Development

Community Development Department
County Administration Building
651 Pine Street
4th Floor, North Wing
Martinez, California 94553-0095

Phone:
(510) 646-2034

Contra Costa County

December 21, 1995

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1325 J Street, Room 1444
Sacramento, CA 95814-2922

Dear Mr. Monroe,

Thank you for the opportunity to review the Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project. Generally, the report is exhaustingly thorough. There are, however, a range of issues which are of concern to the County and to which we need responses.

First, as a statement, we recognize that NEPA requires consideration of a range of alternatives to be discussed throughout the EIR/EIS. However, the Habitat Management Plan (HMP) in the appendices and the thrust of the body of the EIR all imply that Alternative 3 is not really viable in terms of mitigation of project impacts. We could spend considerable effort commenting on that alternative but have chosen not to, given our belief that for that alternative to be chosen additional environmental review would be required. It does not provide mitigations for on-site habitat issues. No off-site solutions are proposed. Given County, State and Federal regulations and policies, the document would need substantial augmentation and recirculation for the selection of Alternative 3. We feel Alternative 1 and 2 effectively cover the worst case scenarios to be considered. C13-1

Second, it would be impossible for the reader not to be aware of the amount of effort and creativity put forth in the development of the proposal. The amount of technical work necessary to analyze this complex project, and the cooperation of the applicant and State and Federal Agencies to bring the document to this point in the process, is obvious. Staff and consultants should be commended for their efforts to date.

Now to specifics on the Draft document. Page 3D-5 discusses the Delta Flood Protection Act of 1988. It indicates in the second paragraph that it authorized $12 million annually through 1998-1999. Should that read 1988-1999? At the end of this C13-2

paragraph it states "under the Delta Flood Protection Act, no project receiving funding from the act can result in a net long-term loss of riparian, fishery, or wildlife habitat, and a DFG finding to that effect must be issued before funds are disbursed." Have any of the four islands in this application received funds under this act? What assurances have been given to DFG and how does this project effect those assurances? C13-3

The role of Local Reclamation Districts is discussed on page 3D-6. If the project is approved as applied for, 3 of the 4 islands will be wholly owned by Delta Wetlands. The project description implies that Delta Wetlands will be responsible for levee repair and maintenance (as does the HMP in the Appendices). What will be the role of the Reclamation Districts relative to the project? Will the 3 wholly owned islands be maintained by Delta Wetlands and the Reclamation Districts be obsolete and be abolished? There may be some merit for abolition of these districts if the islands are wholly owned by a private corporation. The discussion on Financing the Levee System on page 3D-19 is not clear in this regard. That section states that "the cost of reclamation would be much lower than in the use of existing Delta levees because much (emphasized) of the routine maintenance would not fall within State and Federal cost-sharing programs". Specifically, what State and Federal funds are still proposed to be utilized for maintenance? Given the economic analysis found in the EIR, why should any State or Federal funds continue to be needed for levee maintenance and repair? Shouldn't all obligations be transferred to Delta Wetlands except for Holland Tract, (which they won't wholly control)? Since this is listed as a beneficial impact, the final document should clarify any government levee maintenance subsidy that would still accrue to the project. In case of a levee failure, will State and Federal funding (subsidy) be allowed? C13-4 C13-5

Page 3E-2 under Webb Tract references the Delta Ferry Authority. It indicates that this authority is jointly funded by Contra Costa County, the Webb Tract Reclamation District and the Bradford Island Reclamation District. That was an interim financial arrangement. The County is no longer funding the ferry services. The County still collects local funds through a County service area for this service; about $15,000/year. It is transferred to the ferry operator. The impact of this project on the existing ferry service is discussed on page 3E-6 and that anticipates a decline in usage. If that's true, then the project raises the issue of the viability of the continuance of the ferry service. Delta Wetlands may need to subsidize the service to keep it viable. Without the ferry service, the recreational facilities on Webb Tract would probably be infeasible. Having Delta Wetlands subsidize the ferry service should be made a mitigation measure for the project. Impact E-2 needs to be revisited to assure additional ferry operational funding. C13-6 C13-7

The discussion on page 3E-2 indicates that the County in 1993 "abandoned those sections of Holland Tract Road on the west and east perimeter levees past the locked gates". That was done in response to a request of the reclamation district for these vacations. The last time staff visited the perimeter roads on the west and east levees, they were not passable to passenger vehicles, however, trucks and four wheel drive vehicles could utilize those roads. If the recreational facilities are to be approved by the County, improved road access to all the recreation facilities will be required. The roadways will be private driveways and will need to be maintained by either the reclamation district or the owner of the recreation facilities. This should be made a mitigation measure in the Final EIR. C13-8

Mitigation Measure E-4 on page 3E-11, dealing with private security services, is essential if the recreation component is to be developed. C13-9

The discussion of providing fire district services to the recreation facilities on Webb Tract is casually mentioned in Mitigation Measure E-5 on page 3E-11. While procedurally, this mitigation measure is correct, there may be impacts associated with placing this island into a fire district. The Bethel Island Fire Protection District is the nearest district; and it is largely a volunteer fire protection district. Such a district relies on local residents to serve as volunteers and to man the fire equipment. The project description does not indicate if there will be caretakers and/or permanent staff associated with recreational facilities. It does not indicate if Delta Wetlands employees will be largely day workers or if 24 hour a day coverage will be provided. Such employees could form the basis of a volunteer district staff. C13-10

Unfortunately, the response time for fire equipment and manpower to arrive by boat from Bethel Island would be long. On island fire fighting capability would be desirable should the recreation facilities proceed. Mitigation Measure E-6 should be strengthened to require local fire fighting capability to serve the proposed recreational facilities (rather than just annexation to a district). Districts, per se, don't fight fires, manpower and equipment does. The island roads will need to be improved to handle fire equipment.

The discussion of water, sewage and solid waste facilities to serve the recreational facilities is very generalized and merely indicates the need to meet County requirements. The Mitigation Measures E-7, E-10 and E-12 just require obtaining appropriate local and state permits for recreational facility services and utilities. This lack of specificity may require supplemental environmental analysis. C13-11

On page 3F-15 Mitigation Measure F-1 requires providing information to USFWS and DFG on fish habitat. The information called for would be helpful to the Counties in consideration of the permits for location of the recreational facilities. A sentence should be added to this mitigation measure which requires this material to be submitted to the Counties when considering the recreational facilities and urging coordination of that review with USFWS and DFG. C13-12

On page 3I-12 under Webb Tract, it indicates "the clubhouse on the eastern tip of the island is sited above the proposed high water level and could remain onsite". Could this be converted to one of the proposed recreation facilities by Delta Wetlands or are they asking for the other new facilities plus this existing one? The project description Figure 2.3 does not show this existing clubhouse. If it is to remain, does this change the project description? Are there added impacts, e.g., traffic, if it continues to exist? C13-13

On page 3I-12, there is a discussion of the Williamson Act Contract on Webb Tract and that County staff has determined the water component to be consistent with the current Williamson Act. While that is correct, it would be desirable for the applicant to notify the County of his intent to non-renew this contract and the issue of Williamson Act status will resolve itself over time. C13-14

On page 3I-12, it discusses Contra Costa County staff's view that for the proposed level of recreation facilities will require rezoning to Planned Unit District. The same discussion takes place on page 3I-13 dealing with Holland Tract. If these areas aren't to be rezoned then land use permits will be required. Unfortunately Table 4-1 in Chapter 4 Permit and Environmental Review and Consultation Requirements, fails to list either rezoning or land use permits. Those concepts should be added to Table 4-1. Health Department permits for water and sewage issues should also be added to that table, consistent with prior EIR text. C13-15

Page 3I-2 correctly indicates that the Contra Costa County General Plan contains policies which urge the preservation of prime agricultural soils. The County General Plan defines prime agricultural soils as Class I and II soils; it does not utilize the NRCS system. Holland Island and Webb Tract are almost exclusively Class III and IV soils. Consequently, the discussion on page 3I-14 on the conflict with our prime agricultural soils policies in the County General Plan misses the mark. C13-16

Page 3I-6 under Holland Tract, states that Veale Tract is within the Urban Limit Line (ULL) and so development is likely to occur within the next 20 years. This statement C13-17

is incorrect. Being inside the ULL would allow consideration of a general plan amendment from agricultural to urban use, not a presumption that such change could occur. C13-17 cont'd

Page 3L-11 discusses barge traffic to import rock to the project sites for levee stabilization. No source(s) of rock is identified. Importing rock will affect truck trips. No loading points for the barges are identified. Truck trips will affect road capacity. More importantly, if they travel on rural delta roads they could cause substantial impacts to the structural integrity of these roads. The Final EIR needs to identify the probability of truck traffic on specific roads for rock and other construction materials. This discussion needs to be coordinated with the Public Works Departments of the affected counties. Adequate mitigation needs to be suggested in the Final EIR; that could include resurfacing or roads to withstand the wear and tear of the truck traffic. C13-18

On more general issues, there is a recommendation in the DEIR for a $2/acre foot Fishery Enhancement Fund. Will the use of this money be restricted to studies and programs for the Bay Delta System? They should be. Could the mitigation measure be modified to insure notification of the Contra Costa County Water Agency when meetings are held to discuss use of these funds? The use of these funds should be restricted to Bay Delta projects and not be used to cover staff operational costs. A mitigation measure should provide for such limitations. C13-19

Proposed Delta Wetlands project operations could result in lower water quality in some instances, impacting Contra Costa Water District drinking water intakes at Rock Slough and Old River. In particular, it is not clear how project operations could affect CCWD's ability to fill the Los Vaqueror Reservoir. How will project operations affect the ability to fill the Los Vaqueror Reservoir with higher quality water? C13-20

It is not clear how Delta Wetland reservoir filling could occur during below normal and dry water years. What are the effects of reduced reservoir filling versus a full reservoir scenario? If no filling occurs in the absence of surplus flows, how will the reservoir islands be managed? C13-21

Despite the significant degree of evaluation contained throughout Chapter 3 of the draft EIR/EIS and appendices, questions and concerns remain relative to water quality impacts, given the wide range of conditions found over time in a very complex and little-understood Delta system. In addition, the effects on fish due to reduction of outflow and resultant change in flow patterns remains unclear. Models, although helpful in

gauging general change, do not provide a great degree of certainty, given the wide range of varying, complex conditions found in the Delta. For these reasons, Contra Costa County requests that a detailed, ongoing monitoring program be instituted to allow continued specified assessment of these important issues and their impacts, should this project be implemented. This could have an added benefit in continued assessment as to this project's potential for impacts relative to other water rights, (determined not to be significant, as described on page 3A-11). C13-22

The DEIR does not discuss the greenhouse effect and its potential impacts on this project. While the impacts of the concept are sharply debated, the concept that there is something climatically going on that seems to be scientifically defensible. This could effect levee height requirements, etc. Some discussion of this problem would appear mandatory. C13-23

No site specifics are presently included on the proposed recreational facilities. The document did not include any information on if the hunting facilities as proposed, are marketable. Nor did it describe the organization structure. Will they be for individual clubs or will Delta Wetlands manage them as a unit? While a schematic is included in an appendix on what a typical recreation facility design might look like, no interior design or elevations are provided. The exact location of the facilities are not identified. The road improvements necessary to serve the facilities will need to be identified. All these items will be needed by the counties for consideration of the recreational facilities. If Delta Wetlands intends to permit these over time and not all at once (or build them over time), follow-up environmental documentation may be needed. The Final EIR should set the stage for subsequent environmental documents. C13-24

As is clear from the prior comments, most of our concerns focus on the proposed recreational facilities for which the County will be a permitting agency. The Final EIR will be adequate to consider the larger issues behind the Delta Wetlands project. It may, however, need to be supplemented for County consideration of the recreation facilities.

The EIR/EIS does not appear to discuss inclusion of public access onto these islands. The recreation component should include some public access points, and these areas should be included in environmental review of the project. C13-25

As a last comment, the Habitat Management Plan (Appendix C-3) appears to be complete and workable. The hunting component, however, will be dependant on the ability to approve the recreation facilities. That won't be known until after the lead C13-26

State and Federal Agencies make determinations on the water storage concepts. | **C13-26 cont'd**

If you have any questions on these comments, feel free to call Jim Cutler at (510) 646-2034 or Roberta Goulart at (510) 646-2071.

Sincerely yours,

R Goulart for

Jim Cutler
Assistant Director,
Comprehensive Planning

JWC:drb
JWC1995\drb\deltawet.eir
c:diandocs\deltawet.jc
RRG4:monroe.ltr

Contra Costa County Community Development Department

C13-1. The Delta Wetlands Project alternatives (Alternatives 1, 2, and 3) and the No-Project Alternative were selected to represent a range of project operations for purposes of determining environmental impacts. Although Alternative 3 represents the maximum water diversions under Delta Wetlands' water right application, it is not proposed by the project applicant. As described in Chapter 2 of Volume 1 of this FEIS, the project applicant's proposed project consists of storage of water on two reservoir islands and implementation of an HMP on two habitat islands. This FEIS recognizes that implementation of Alternative 3 would require additional offsite mitigation of impacts on wildlife and wetlands (see Chapters 3G and 3H).

C13-2. The reference to 1998–1999 in the second paragraph on page 3D-5 of the 1995 DEIR/EIS (see page 3D-5 of FEIS Volume 1) refers to the fiscal year through which the Delta Flood Protection Act applies. To clarify this information, the third sentence is revised to read as follows:

> The Delta Flood Protection Act of 1988 authorized $12 million annually ~~through 1998-1999~~ between fiscal years 1988–1989 and 1998–1999, with the money to be split between supplementing local revenues and funding special levee projects in the western Delta and flood protection for Walnut Grove and Thornton.

C13-3. The reclamation districts on the four Delta Wetlands Project islands currently receive funding under the Delta Flood Protection Act and may continue to receive such funding after the proposed project is built. As described in response to Comment B6-18 from DFG, the activities of current and former landowners of the Delta Wetlands Project islands conducted under the Delta Flood Protection Act (SB 34) program are not part of the proposed project or project alternatives. These activities, regulated by Delta Wetlands, are subject to separate environmental review and mitigation requirements.

C13-4. The reclamation districts are made up of an island's landowners. These districts finance levee maintenance work through assessments on protected landowners. The reclamation districts for the Delta Wetlands Project islands would continue to operate and maintain the island levees as a quasi-public agency in accordance with the rules and regulations contained in the State Water Code. Currently, there are many single-owner reclamation districts in the Delta; the districts for the Delta Wetlands islands would not be unique. The sole ownership of an island does not change the responsibilities of the reclamation district.

C13-5. As described in response to Comment C13-3 above, the Delta Wetlands Project islands would continue to be eligible for state and federal funding for levee protection. The long-term costs of levee maintenance likely would be lower under project conditions for several reasons. First, Delta Wetlands would invest considerable funds to improve the reservoir islands' perimeter levees at the onset of the project. In addition, Delta Wetlands would implement a comprehensive levee monitoring program to help detect levee stability

problems and reduce the risk of levee failure. Finally, project operations would reduce the rate of subsidence on the islands, which would contribute significantly to levee maintenance costs under future no-project conditions.

C13-6. Ferry services provided by the Delta Ferry Authority were discussed generally in Chapter 3E, "Utilities and Highways" of the 1995 DEIR/EIS, on page 3E-2 under "Highways, County Roads, and Ferry Service". The 1995 DEIR/EIS has been revised to update the description of Contra Costa County's involvement in funding the ferry service. The last sentence of the first paragraph under "Webb Tract" (FEIS page 3E-2) and the last sentence of the second paragraph under "Webb Tract" (FEIS page 3L-3) is revised as follows:

> ~~The ferry system is funded under a resolution by Contra Costa County, Webb Tract Reclamation District and the Bradford Island Reclamation District, at one-third per entity.~~ The ferry system is funded through the Delta Ferry Authority. The Delta Ferry Authority is composed of Contra Costa County, Webb Tract Reclamation District, and Bradford Reclamation District. Each reclamation district provides approximately $50,000 per year in funding for the ferry service (Heringer pers. comm.), while Contra Costa County collects approximately $15,000 per year in local funds to support the ferry service (Cutler pers. comm.). The Delta Ferry Authority collects these monies to fund operation of the ferry.

The following citations have been added to Chapter 3E:

> Cutler, Jim. Assistant director, Comprehensive Planning. Contra Costa County Community Development Department, Martinez, CA. December 21, 1995—letter to Jim Monroe, U.S. Army Corps of Engineers, commenting on the 1995 Draft Environmental Impact Report/Environmental Impact Statement for the Delta Wetlands Project.
>
> Heringer, Ralph. Operations. Delta Ferry Authority (Bouldin Farming Company), Contra Costa County, CA. February 27, 1996—telephone conversation with Amanda Brodie of Jones & Stokes.

C13-7. The Delta Wetlands Project and Bradford Island have a mutual need for the use of the ferry system. The projected traffic volumes for recreational use of the Delta Wetlands Project islands reported in the 1995 DEIR/EIS indicate that ferry use to Webb Tract would be greater after project implementation than it is now. Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities", describes a proposed mitigation measure that would reduce recreation-related traffic. As described in Chapter 3E, changes in ferry use would not affect funding for the ferry system because ferry revenues are not generated by passenger fees, and Delta Wetlands does not foresee withdrawing funding or discontinuing the ferry service as a result of the Delta Wetlands

Project. The following text is added after the revised text in Comment C13-6 above (page 3E-3 of FEIS Volume 1) to illustrate this point:

> The Delta Wetlands Project and Bradford Island have a mutual need for the use of the ferry system. Delta Wetlands anticipates the ferry system would be used by recreationists and staff workers that are employed at the recreation facilities on Webb Tract. Delta Wetlands does not foresee the withdrawal of funding or discontinuing the ferry service (Forkel pers. comm.).

The following citation has been added to Chapter 3E:

> Forkel, Dave. Project manager. Delta Wetlands, Lafayette, CA. February 20, 1996—telephone conversation with Amanda Brodie of Jones & Stokes.

C13-8. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

C13-9. The provision of private security for the recreation facilities and boat docks is described under "Police and Fire Protection Services" on page 3E-11 in Chapter 3E, "Utilities and Highways" of the 1995 DEIR/EIS (page 3E-11 of FEIS Volume 1). See also Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

C13-10. In response to this comment and based on subsequent conversations between the lead agencies, Delta Wetlands, and Contra Costa County, local firefighting capability would be developed on Webb Tract. Caretakers employed at the recreation facilities who are available 24 hours a day would be certified and trained to serve as volunteer firefighters. Firefighting equipment would be acquired and available for response to fire emergencies on Webb Tract.

The 1995 DEIR/EIS has been changed to include additional information regarding the development of fire district services on Webb Tract. The end of the first paragraph under Mitigation Measure E-6 has been revised to include the following text (see page 3E-11 of Volume 1 of this FEIS):

> In addition, as part of the operation of the proposed recreation facilities, caretaker staff would be available 24 hours a day, trained, and certified to serve as volunteer firefighters. Delta Wetlands would acquire firefighting equipment necessary to provide adequate fire protection services on Webb Tract.

C13-11. As stated in response to Comment A3-3, the governing counties, which are responsible agencies in the CEQA process, have been consulted regarding the requirements for issuing permits for sewage facilities on the Delta Wetlands Project islands. Based on these discussions, more information has been added to Mitigation Measure E-7 (see response to Comment A3-3). If, when specific design details for recreation facilities are submitted to regulating agencies (i.e., the county), the agency determines that the NEPA and CEQA

documentation already prepared for the project does not cover site-specific environmental impacts (including water, sewage, and solid waste services) in enough detail, it may require additional environmental documentation before approving permits or entitlements. See responses to Comments A3-3 and B5-3 for more information.

C13-12. Since this comment letter was submitted, the lead agencies have concluded formal consultation with DFG, NMFS, and USFWS on project effects on listed fish species. As part of the consultation process for compliance with the federal and California ESAs, USACE, the SWRCB, NMFS, USFWS, DFG, and Delta Wetlands agreed on the project operating parameters referred to as the FOC, which have been incorporated into the proposed project. DFG, NMFS, and USFWS subsequently issued no-jeopardy biological opinions regarding project effects on listed species. The FOC and biological opinion RPMs reduce potential project effects to a less-than-significant level and replace all the mitigation measures proposed in the 1995 DEIR/EIS; therefore, no change to Mitigation Measure F-1 has been made in response to this comment. For information about the biological opinions, see Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

Delta Wetlands would be required to obtain approvals from Contra Costa and San Joaquin Counties before constructing boat docks. If, when recreation facility designs are submitted, the local regulating agency determines that the NEPA and CEQA documentation already prepared for the project does not cover site-specific environmental impacts in enough detail, it may require additional environmental documentation before approving permits or entitlements. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities", for information about local approvals needed for the recreation facilities.

C13-13. The existing clubhouse on the eastern tip of Webb Tract would remain and would likely be remodeled and enlarged to serve as one of the proposed recreation facilities on Webb Tract. No more than 11 recreation facilities would be established on the island, as described in Chapter 3J. No changes to the impact assessment for the recreation facilities are required. See also Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

C13-14. The decision on whether to renew the Williamson Act Contract on Webb Tract would be made by Delta Wetlands in consultation with the county.

C13-15. Rezoning and land use permits are discussed in "Consistency with Zoning and General Plan Designations" on page 3I-12 of Chapter 3I, "Land Use and Agriculture", of the 1995 DEIR/EIS (page 3I-14 of FEIS Volume 1). Water and sewage permits are discussed in the "Water Supply Facilities and Sewage Disposal Service" section on page 3E-11 of Chapter 3E, "Utilities and Highways", of the 1995 DEIR/EIS (page 3E-12 of FEIS Volume 1). Table 4-1 of Chapter 4, "Permit and Environmental Review and Consultation Requirements", has been revised to include a description of the necessary rezoning and

land use permits and the water and sewage permits for the water supply facilities and sewage disposal service. The following information has been added to the table:

Agency and Requirements	Agency Authority	Project Activities Subject to Requirements
Contra Costa County		
Sewer Permit	The sanitary district approves and issues permits to ensure conformance with sanitary standards and sanitary sewer work related to the repair, construction, reconstruction, or abandonment of any building sewers, connections, or discharge to a district sewer system.	Construction of recreation facilities
Land Use Permit	The community development department issues permits to allow special zoning considerations or waive existing zoning regulations regarding the way that a property is to be used.	Construction of Delta Wetlands reservoir islands and recreation facilities

C13-16. Based on the criteria used by the Contra Costa County Community Development Department to identify prime farmlands within its jurisdiction, the 1995 DEIR/EIS analysis of the project's consistency with Contra Costa County General Plan Policy 8-H has been changed to indicate that Alternatives 1, 2, and 3 are considered consistent with this policy.

On page 3I-12 of the 1995 DEIR/EIS (page 3I-14 of FEIS Volume 1), the last (partial) paragraph has been deleted and replaced with the following:

> **Consistency with General Plan Principles.** Implementation of Alternative 1 would be consistent with the open space and wildlife goals and policies of the CCCGP. However, Alternative 1 is not consistent with the county's agriculture policy to encourage and enhance agriculture, and to maintain and promote a healthy and competitive agricultural economy (Policy 8-G, Table 3I-7). Although the inherent agricultural productivity of the islands would not significantly change as a result of the use of agricultural land for water storage (see "Changes in Agriculture Conditions" below), implementation of Alternative 1 would remove agricultural land in Contra Costa County from production, which is not consistent with this policy. Implementation of Alternative 1 would not be inconsistent with Policy 8-H, which encourages the preservation of prime agricultural land (Table 3I-7) because Contra Costa County does not consider Webb Tract's Class III and IV soils to represent prime farmland.

On page 3I-14 (page 3I-15 of FEIS Volume 1), the first full paragraph has been deleted and replaced with the following:

> **Consistency with General Plan Principles.** Implementation of Alternative 1 would be consistent with the open space and wildlife goals and policies of the CCCGP because Holland Tract would be managed for wildlife habitat (Table 3I-7). However, Alternative 1 is not consistent with the county's agriculture policy to encourage and enhance agriculture, and to maintain and promote a healthy and competitive agricultural economy (Policy 8-G, Table 3I-7). Although the inherent agricultural productivity of the islands would not significantly change as a result of the use of agricultural land for habitat management (see "Changes in Agriculture Conditions" below), implementation of Alternative 1 would remove agricultural land in Contra Costa County from production, which is not consistent with this policy. Implementation of Alternative 1 would not be inconsistent with Policy 8-H, which encourages the preservation of prime agricultural land (Table 3I-7) because Contra Costa County does not consider Holland Tract's Class III and IV soils to represent prime farmland.

On page 3I-14 (page 3I-16 of FEIS Volume 1), the fourth full paragraph has been deleted and replaced with the following:

> **Impact I-3: Inconsistency with Contra Costa County General Plan Policy for Agricultural Lands.** Implementation of Alternative 1 would convert 6,300 acres of farmland on Webb and Holland Tracts to water storage and habitat uses, respectively. This conversion, and subsequent loss of agricultural production, is not consistent with the county's agricultural principle to maintain and promote a healthy and competitive agricultural economy (Table 3I-7). Although the inherent agricultural productivity of the islands would not be significantly changed by the use of agricultural land for water storage or habitat management, the proposed use is not consistent with this general plan principle. Therefore, this impact is considered significant and unavoidable.

On page 3I-18 (page 3I-20 of FEIS Volume 1), the last sentence of the sixth full paragraph has been revised as follows:

> ~~Conversion of prime agricultural land to water storage on Holland Tract would be inconsistent with CCCGP agricultural goals.~~ Conversion of farmland to water storage on Holland Tract would be inconsistent with the CCCGP agricultural policy (Policy 8-G) concerning the maintenance and promotion of a healthy and competitive agricultural economy (Table 3I-7).

In Table 3I-7, the consistency analysis (i.e., right hand column of the table) of Policy 8-H has been deleted and replaced with the following:

> Consistent: Implementation of the proposed project would remove agricultural land in Contra Costa County from production; however, Contra Costa County does not consider the Class III and IV soils on Holland and Webb Tracts to represent prime farmland. Therefore, the conversion of farmlands on these islands is not considered inconsistent with the county's policy of preserving prime agricultural lands for agricultural production.

C13-17. Veale Tract is discussed in the 1995 DEIR/EIS under "Land Uses near Holland Tract" on page 3I-6 in Chapter 3I, "Land Use and Agriculture" (see page 3I-7 of FEIS Volume 1). The text has been revised as follows:

> Veale Tract is within the urban limit line for Contra Costa County, so a general plan amendment to rezone the island from agricultural to urban use may be considered ~~urban development will likely occur on Veale Tract~~ in the next 20 years.

C13-18. The 1995 DEIR/EIS has been amended to indicate that the most likely construction scenario would involve rock barges loaded directly from the San Rafael rock quarry on San Pablo Bay. Therefore, no truck trips would be generated by the transport of rock. The following sentence has been added to the first paragraph under "Navigation" (page 3L-13 of FEIS Volume 1):

> These barges are most likely to be loaded directly from a quarry located on the water (e.g., the San Rafael rock quarry on San Pablo Bay).

It should also be noted that, as indicated by Table 3L-6, the number of vehicle trips generated by other aspects of construction is low and would not result in the addition of a high number of trips by heavy trucks or other types of vehicles to roadways in the project vicinity (see Impact L-1). Therefore, no additional mitigation is required.

C13-19. The Delta Wetlands research fund, described in Chapter 2 of FEIS Volume 1, is not a mitigation measure to offset impacts of the proposed Delta Wetlands Project; it is a contribution toward Delta research and part of Delta Wetlands' proposed project. The Delta Wetlands environmental research fund is not a "fishery enhancement fund". As described in Chapter 2, the Delta Wetlands environmental research fund would be used for research in the Delta and would not be used to fulfill project permit or operation requirements.

C13-20. See responses to Comments C9-1, C9-17, and C9-22 from CCWD.

C13-21. As described in Chapter 2 of the 1995 DEIR/EIS and of FEIS Volume 1, Delta Wetlands diversions would occur only when all Delta outflow requirements are met and when the export limit is greater than the permitted pumping rate, so that water that is allowable for export is not being exported by the SWP and CVP pumps (see pages 2-6 and 2-7 of FEIS Volume 1). The FOC place further restrictions on Delta Wetlands diversions, as described in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions". Therefore, the reservoirs would not be filled during some below-normal or dry water years. As described on page 2-8 of the 1995 DEIR/EIS (page 2-10 of FEIS Volume 1), when water is not being stored on the reservoir islands, shallow water could be managed to create wetland habitat and enhance forage and cover for wintering waterfowl.

C13-22. To fully determine the effects of the Delta Wetlands Project, actual conditions under project operations need to be monitored on an ongoing basis. The 1995 DEIR/EIS proposed monitoring and adaptive management measures to prevent significant project effects on water quality and fisheries. The FOC terms, which were developed after completion of the 1995 DEIR/EIS and incorporated into the proposed project, include an extensive fish monitoring program. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for a description of the elements of this program. Master Response 4 also includes information on other FOC measures that reduce potential project effects on fish by reducing project effects on flows.

In addition, in October 2000 Delta Wetlands and CCWD submitted a protest dismissal agreement to the SWRCB that includes the Delta Wetlands Project WQMP negotiated by Delta Wetlands and CUWA, which calls for extensive water quality monitoring and reporting by Delta Wetlands. Compliance with the terms of the WQMP will allow coordination of Delta Wetlands Project operations with SWP/CVP and CCWD operations. The Delta Wetlands–CCWD agreement, including the WQMP, is included in the Appendix to the Responses to Comments.

C13-23. The "greenhouse effect" postulate theorizes that changes in the earth's atmosphere will cause global warming and that seawater levels would rise in response to the melting of polar ice caps and to thermal expansion of seawater. This effect would occur over a very long period of time and likely would not be evident during the 50-year period analyzed in the 1995 DEIR/EIS. As stated by the commenter, changes in seawater levels could affect levee height requirements, but these changes would occur gradually and would be accommodated by levee maintenance during that time. The freeboard provided by Delta Wetlands Project reservoir island levees would provide ample latitude for changes in water elevations during the project's time frame.

C13-24. The recreation facility design described in the 1995 DEIR/EIS and shown in Figures 2-7 and 2-8 of Appendix 2 are preliminary and are used for analysis of the facilities in the document. The organizational structure of the recreation facilities has not been determined but does not influence the environmental impacts described in the 1995 DEIR/EIS. See response to Comment C2-1 and Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities"..

C13-25. The analysis presented in the 1995 DEIR/EIS assumed that the recreation facilities on the Delta Wetlands Project islands would be privately owned and operated. Implementing the Delta Wetlands Project would not reduce public access or opportunities for recreation on the project islands; therefore, the lead agencies have not required that Delta Wetlands provide for public recreation as mitigation. See responses to Comments B6-21, C2-2, and C5-1 for more information.

C13-26. The hunting component of the HMP does not depend on the approval of recreation facilities. The hunting levels identified in the HMP could be supported without those facilities; these levels are based on the amount of hunting that the predicted waterfowl use of the Delta Wetlands Project islands could support. See Chapter 3J, "Recreation and Visual Resources", for more information.

MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Office of the General Manager

December 21, 1995

Mr. Jim Sutton
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, California 95812-2000

Mr. Jim Monroe
U.S. Army Corps of Engineers
Regulatory Branch
1325 J Street, 14th Floor
Sacramento, California 95814-2922

Dear Mr. Sutton and Mr. Monroe:

Draft Environmental Impact Report/Environmental
Impact Statement for the Delta Wetlands Project

We have received the Draft Environmental Impact Report/Environmental Impact Statement (DEIR/EIS) for the Delta Wetlands Project (DW Project). The proposed project involves the diversion and storage of water onto two Delta islands for later discharge for export or outflow requirements, the seasonal diversion and use of water for wetlands and wildlife habitat management on two other Delta islands, and the construction and operation of recreation facilities along the levees of all four islands. The comments herein represent the response of the Metropolitan Water District of Southern California (Metropolitan) as a potentially affected public agency.

Introduction

Metropolitan was formed in 1928 under an enabling Act of the California legislature. Historically, Metropolitan has provided supplemental water to the Southern California coastal plain to augment local water supplies developed by surface catchment, groundwater production, and wastewater reclamation. This supplemental water is delivered to 27 member agencies through a regional network of canals, pipelines, reservoirs, treatment plants, and appurtenant works. Metropolitan receives water from

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the California Aqueduct of the State Water Project (SWP) and from the Colorado River Aqueduct for distribution to about 250 cities and unincorporated communities within a 5,200-square-mile service area covering portions of Ventura, Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties. Metropolitan currently provides about 55% of the water used in its service area.

Metropolitan is one of 29 agencies that have contracts with the Department of Water Resources (DWR) for SWP water supplies. Metropolitan's contract is for 2.011 million acre-feet per year, or nearly half of the total contracted SWP supply. This SWP supply constitutes a significant portion of the supplies available to Metropolitan.

Metropolitan is very interested in matters affecting conditions in the Sacramento-San Joaquin Delta (Delta). Metropolitan's participation in the development of the Bay/Delta Accord, and more recently in the ongoing CalFed process, is an indication of such commitment. In these efforts, Metropolitan has been working closely on several key issues with the California Urban Water Agencies (CUWA), of which Metropolitan is a member. Metropolitan has reviewed and provided input into CUWA's comment letter on the DEIR/EIS, and supports the findings contained therein.

Overall

In general, Metropolitan is supportive of planning efforts which are designed to meet the increasing water needs of California in an environmentally sound manner. The DW Project is clearly an attempt to achieve a balance between beneficial uses of water. After review of the DEIR/EIS, however, Metropolitan has concerns that the proposed DW Project could adversely affect the quality and quantity of the SWP water it receives from the Delta, and could adversely affect Delta fisheries. The following comments from Metropolitan should be fully addressed in the final EIR/EIS, and the impacts that have been identified need to be avoided or mitigated to a level of insignificance. C14-1

Water Quality

Inaccuracies of Water Quality Tests Performed

In Appendices C2 and C3 of the DEIR/EIS, which describe the water quality testing done to analyze Delta agricultural drainage and potential sources of dissolved organics and trihalomethane precursors, the discussions refer to problems experienced by the DW Project's contract laboratory in their testing. These include

problems with the measurement of trihalomethane formation potential (THMFP) (pages C2-9 and C3-9), and variability problems associated with the DW Project contract laboratory analytical measurements (page C3-10).

These problems, as described briefly below, call into question the accuracy of: the results of these tests performed, any analyses performed using these results, and any determination of significance or proposed mitigation based on these results. This is especially significant with regards to THMFP and its impacts on Metropolitan's SWP water supplies. These water quality testing problems should be corrected, or at a minimum discussed and the resulting implications identified, in the final EIR/EIS so that potential impacts of the DW Project on water quality can be accurately identified and appropriately mitigated. C14-2

THMFP Testing Method--The analytical method for THMFP currently used by DWR has changed from the method described in the DEIR/EIS on page C2-9. The current method requires dilution of samples containing more than 10 mg/l of dissolved organic carbon (DOC) before addition of a 120 mg/l standard chlorination dose, not 30 mg/l of DOC as is described in the DEIR/EIS. This is documented in greater detail in the attached "Detailed Water Quality Comments on Delta Wetlands Project EIR/EIS" (Water Quality Comments), primarily on pages 1 through 3. The Water Quality Comments also includes additional background information regarding problems with the THMFP method that are not documented in the DEIR/EIS, and includes references to document the justification for changes that were made in the DWR THMFP method. C14-3

Testing Laboratory Quality Control Problems--Metropolitan's review of the analytical methods utilized by the DW Project's contracting laboratories related to THMFP and other water quality testing identified several areas of possible quality control problems. These problem areas, described in detail in the attached Water Quality Comments, pages 4 through 6, include the following:

- Filtration of samples through an appropriate filter to remove suspended matter was not performed, affecting the THMFP test. C14-4
- In the vegetation decay experiments, samples collected with hydrogen sulfide were not filtered to remove the hydrogen sulfide, affecting the THMFP test.
- In some earlier tests, chlorine residual at the end of THMFP tests was not measured.
- THMFP samples were not pH-adjusted.

- A standardized THMFP protocol and a calibrated chlorine solution were not used, resulting in inconsistent THMFP test results.
- Chlorine solutions were not stored at the proper temperature. C14-4 cont'd
- Anion/cation balance checks were not performed, and could have identified measurement problems.

Impacts of Storing Water on DW Islands

Vegetation Decay Experiments--The DEIR/EIS covers vegetation decay experiments on page C3-3, pages C3-8 to C3-13, and Tables C3-4 through C3-7. As indicated in the DEIR/EIS on page C3-9, duplicate samples were sent to Metropolitan for analyses of water quality parameters. The attached Water Quality Comments, pages 6 and 7, contains additional technical information on these experiments and includes the conclusion that data from the vegetation decay experiments indicates that the wetlands vegetation can contribute disinfectant by-products (DBP) precursors into the Delta. Metropolitan's analysis indicates that these DBPs include trihalomethanes (THM) and haloacetic acids (HAA). Failure to recognize such information has resulted in the conclusions in the DEIR/EIS regarding increased THM levels to be understated. Additional analysis should be conducted to address increased THM and HAA levels caused by vegetation decay and should be included in the final EIR/EIS. C14-5

Soil Water Extraction Experiments--These experiments are covered in the DEIR/EIS on page C3-3, pages C3-13 to C3-16, and Tables C3-8 and C3-9. The DEIR/EIS indicates that subsamples of diluted extract volumes from the soil water extraction experiments were sent to Metropolitan for analyses. The attached Water Quality Comments, pages 7 and 8, contains additional technical information on the experiments and resulting DOC and THMFP levels. The soil water extraction experiments conducted by Metropolitan led to the conclusion (similar to the vegetation decay experiments) that the DW Project will release high levels of DOC and THM precursors into the Delta. Based on these results, the conclusions contained in the DEIR/EIS relating to soil water extraction may lead to an under-estimation of increased THM levels. Information contained in the attached Water Quality Comments on increased DOC and THM levels from soil water extraction should be included in the final EIR/EIS in the analyses of overall THM and DOC increase caused by the DW Project. C14-6

Holland Tract Wetlands Experiments--The Holland Tract Wetlands Experiments conducted in 1989 and 1990 are described in the DEIR/EIS on pages C3-6 to C3-8, with results summarized in Tables C3-2 and C3-3. Metropolitan's analysis of these tests indicates that the data and resulting calculations and conclusions are seriously flawed C14-7

(see attached Water Quality Comments, pages 8 and 9). In addition, testing conducted at Metropolitan (see attached Water Quality Comments, pages 9-11) indicate that release of water from wetlands or agricultural drains will increase THM precursor loading in water exported from the Delta and will significantly increase THM levels in Delta waters following chlorination. Based on these results, any conclusions drawn from the Holland Tract Wetlands Experiment are incorrect regarding THM levels and under-estimate the severity of THM formation potential caused by wetland discharges. Discussions, analysis, and mitigation in the final EIR/EIS should be revised to reflect this information. C14-7 cont'd

Impact of DW Project on Compliance with Drinking-Water Regulations

Drinking Water Regulations--The DEIR/EIS states that by restricting DW Project discharges to prevent either (a) an increase in THM concentrations of more than 20 µg/l, or (b) THM concentrations in treated Delta export water of greater than 90 µg/l, that the impacts of elevated THM concentrations would be less than significant. This finding is inappropriate because it fails to recognize that THM standards will be made more stringent in the near future (EPA's Draft Disinfectants/Disinfection By-products Rule (Draft D/DBP Rule) contains Stage 1 and Stage 2 regulations for THMs of 80 µg/l and 40 µg/l, respectively). In addition, the Draft D/DBP Rule proposes to include five HAAs which are not discussed or studied in the DEIR/EIS. Provisions of current and future regulations, including the Draft D/DBP Rule and the Information Collection Rule, will impact agencies treating Delta water for potable use (see attached Water Quality Comments, pages 11-12). In the final EIR/EIS, the impacts of the DW Project need to be compared against these new regulations. C14-8

Impact of DW Project on Compliance with Regulations--The DEIR/EIS predicts that the DW Project will reduce DOC and THMFP compared to current agricultural operations. This prediction is not conclusively supported by data and assumptions. It is not certain that the DW Project will significantly improve the quality of water exported from the Delta (see Water Quality Comments, page 12). Unless supportable analyses are undertaken to accurately characterize the DOC and DBP formation caused by wetlands and by agricultural activities, the predictions contained in the DEIR/EIS should be deleted, or the uncertainties surrounding them discussed. C14-9

Effects of Soil Submergence

The physico-chemical nature of submersed soils (sediments) is greatly different than that of terrestrial soils. The DW Project sediments will be anaerobic from 1-mm to 5-mm below the sediment-water interface (SWI) as a result of the consumption of oxygen in the decomposition of organic matter and the slow rate of oxygen diffusion in water as opposed to air (10,000 x slower). As a result of decomposition in the sediment, C14-10

the pH and oxidation/reduction (REDOX) potential of sediments is greatly reduced, resulting in the increase in solubility and mobility of many organic and inorganic constituents which may adversely affect water quality. The anaerobic, low REDOX environmental conditions of submersed soils may lead to increased leaching of pesticides and other contaminants from the reservoir sediments (see following section on Pesticide Monitoring), thereby intensifying the effects of sediment resuspension and pore-water pumping (see following sections on Impacts of Sediment Resuspension and Pore-Water Pumping). C14-10 cont'd

The effect of soil submergence and concomitant increased solubility and mobility of nutrients, metals and other compounds should be addressed in the final EIR/EIS, particularly with regard to the specific issues identified below.

Pesticide Monitoring--The potential for the DW Project to contaminate Delta water with pesticides is addressed on page 3C-11 of the DEIR/EIS, which states "Pesticide residues were low to nondetectable for agricultural chemicals known to have high potential to leach from soils." Further, "Detected residues of three herbicides observed in one soil sample from Bacon Island were the result of recent application and do not represent a concern regarding water contamination because herbicides undergo rapid chemical degradation." Problems with these statements are discussed below.

- The DEIR/EIS has focused concern only on pesticides "known to have high potential for leaching from soils." Agricultural soils are not typically submerged for extended periods as the island soils will be during the DW Project operation. Therefore, the physico-chemical nature of the DW Project island sediment environment will be greatly different from agricultural soils, under which the potential for leaching from soils was evaluated. The solubility of a wide range of compounds significantly increases under the conditions typically found in submersed soils or sediments. Therefore, the ease of leaching of compounds considered by the DEIR/EIS may be underestimated and other compounds with significant potential for leaching may not have been fully considered. C14-11

- Metropolitan's experience with herbicides demonstrates that there is misinformation and a lack of understanding surrounding the "rapid degradation" of herbicides. The actual rate of degradation is a function of soil conditions and the favorableness of the soils for microbial productivity. In fact, some of these compounds do not degrade rapidly. These compounds do, however, adsorb to particles and dilute in runoff water leading to the appearance of degradation. The rate of leaching of these compounds after adsorption is not well defined.

For the reasons outlined above, it is necessary that the water stored in the DW Project reservoirs be monitored for regulated and required-unregulated pesticides in drinking water. Operational levels must be established above which water cannot be released into the Delta. This should be addressed in the final EIR/EIS. C14-11 cont'd

Mosquito Abatement--A result of the implementation of the DW Project will be an increase in the human population for recreation activities on the DW Project islands. The increased levels of people, coupled with the increased mosquito breeding habitat produced by the DW Project, will result in increased need for mosquito abatement. In addition to the management strategies outlined in the DEIR/EIS on pages 3N-13, 14, this abatement effort will very likely result in an increase in use of chemical abatement methods. C14-12

The increased use of chemical abatement methods has not been addressed in the DEIR/EIS. This increased use of chemical abatement methods and its effect on water quality should be addressed. Where appropriate, these chemicals should be included in the pesticides monitored on the DW Project islands that are regulated and required-unregulated in drinking water.

Impacts of Sediment Resuspension--The DEIR/EIS addresses the potential for sediment resuspension on the DW Project reservoir islands. Page 3C-6 states, "- runoff and resuspension episodes are relatively infrequent, persist for only a limited time, and therefore are not often detected in regular sampling programs." The DEIR/EIS further states, "The DW Project reservoir islands are expected to act as settling basins; therefore, suspended sediment concentrations are expected to be considerably lower in discharges than in Delta channels." Hydrodynamic modeling within the DW Project island reservoirs was apparently not performed. These statements dismiss the importance of sediment resuspension, may be incorrect and do not adequately address the issue of sediment resuspension. These issues are discussed below:

- Contrary to the DEIR/EIS, the reservoirs are very likely to have significant levels of resuspended sediments (cf. Lawrence et al. 1991, "Wind-wave-induced suspension of mine tailings in disposal ponds - a case study." *Canadian Journal of Civil Engineering*, 18:1047-1053; and Rowan et al. 1992. "Estimating the Mud Deposition Boundary Depth in Lakes from Wave Theory." *Canadian Journal of Fisheries and Aquatic Sciences* 49:2490-2497). Sediment resuspension events are likely to be more frequent than asserted, as a result of the shallow depth and long fetch (open-water distance) of the island reservoirs. In addition, because of its low density, the high level of particulate organic matter in these soils will be susceptible to resuspension. Specifically, the sediment water interface flow velocities and shear stress should be modeled as per the citations above and the susceptibility of the reservoir island soils to resuspension (cf. Bengtsson and Hellstrom 1992. C14-13

"Wind-induced Resuspension in a Small Shallow Lake." *Hydrobiologia* 241:163-172; Sfriso et al. 1991. "Field Resuspension of Sediments In the Venice Lagoon." *Environmental Technology Letters* 12:371-379).

- Internal nutrient loading (loading from the sediments) will be increased by resuspension of sediment and must be addressed. Even if the premise of the DEIR/EIS is correct and episodes of sediment resuspension will be infrequent at static pool elevations, their impact on nutrient release should be addressed. Addressing this issue is even more important with the higher levels of sediment resuspension that will probably occur.

- As water depth decreases, at a certain point the critical wave height ratio (the ratio of critical wave height to depth of water, where the critical wave height = 77% of the maximum wave height) will be exceeded for bottom sediments. As this occurs, shear stress exceeds cohesion of the material, and sediments return to suspension. This releases porewater constituents, produces a breakdown in the redox gradient in the now-disturbed sediments, solublizes sorbed and sulfide-precipitated constituents, and leads to a "spike" in both suspended and dissolved materials. This contrasts with the maintenance of high water quality, for either local or exported water. **C14-13 cont'd**

- Increased algal productivity will result from the increase in release of nutrients from the sediments.

- If contaminants are present, sediment resuspension will result in their increased release from the sediments to the water column.

- In addition to the increase in particulate organic carbon (POC) with resuspended sediments, DOC levels will be increased and exacerbate the DOC and THM problem.

- The resuspension of sediments can cause stress in zooplankton communities resulting in reduced health and productivity of this important component of the food web upon which the fisheries' productivity depends. This stress can be the result of depleted oxygen or the release of toxicants from the sediments (cf. Bledczki, 1991. "Zooplankton Under Stress Caused by Sediment Resuspension," *Verhandlungen Internationale Vereinigung Limnologie*) (see previous section on Pesticide Monitoring).

Sediment resuspension is potentially a serious threat to water quality. Therefore, this issue must be more completely addressed in the final EIR/EIS.

Pore-Water Pumping--With the shallow depth of these reservoirs, each surface wave will likely result in a corresponding pressure wave moving across the bottom sediments. These pressure waves will force water through the pores between sediment particles, forcing this interstitial water, which is high in dissolved nutrients, metals and other compounds (see previous section on Pesticide Monitoring) out of the sediments into overlying waters. This pore-water pumping will effectively extract dissolved materials from the sediments, and subsequently exacerbate the release of nutrients and contaminants from the soils. This fact reinforces the need to monitor the water for regulated and required-unregulated pesticides and other contaminants suspected of being in the reservoir island soils. The DEIR/EIS fails to recognize this phenomenon and as a result under-estimates increased contamination in DW Project discharges. These impacts should be analyzed and included in the final EIR/EIS. C14-14

Water Supply and Water Project Operations

No Integration with Other Water Project Operations

The water supply and water project operation analyses presented in the DEIR/EIS were performed using a Delta operations model (DeltaSOS) that is not integrated with the operations of the SWP and the Central Valley Project (CVP), water projects which control much of the water flowing into and being exported from the Delta. While the DeltaSOS model uses as input the results from a model of SWP/CVP operations (DWRSIM), DeltaSOS does not have the ability to reoperate reservoirs either upstream or south of the Delta, coordinate DW Project discharge with demand south of the Delta, or evaluate the supply impacts of any change in Delta outflow requirements resulting from DW Project operations. C14-15

Without an integrated analysis of project operations, the potential impact of the proposed DW Project on SWP and CVP supplies cannot be determined; the amount and frequency of water estimated to be diverted and discharged, and the resulting impacts of those diversions and discharges, may be overstated; DW Project yield would be overestimated; and the potential benefits of holding water in upstream reservoirs and discharging DW Project water either for export or outflow instead cannot be determined. While the lack of full integration of the proposed DW Project with the SWP and CVP is described on page A1-2, potential errors in results due to this lack of integration are not disclosed.

The accuracy of the water supply and operation analyses should be improved in the final EIR/EIS by incorporating a DW Project reservoir into an SWP/CVP operations model such as DWRSIM. C14-15 cont'd

Potential SWP/CVP Water Supply Impacts

Because of the way in which operation of the DW Project was modeled, there is no way to assess potential impacts of DW Project operations on the quantity of SWP and CVP water supplies. This is because SWP/CVP operations were modeled in one model and those operational results were fed into a second model to operate the DW Project, with no feedback to the original SWP/CVP operations. This lack of feedback or integration precludes any determination of potential impacts of the DW Project on SWP/CVP supplies. An example of a potential water supply impact is the X-2 outflow requirement, a portion of which is dependent on antecedent outflow. To the extent that DW Project diversions reduce outflow to a point where X-2 outflow requirements are increased in a succeeding month, the SWP and CVP could be required to release additional water to meet that requirement, which could result in a decrease in SWP/CVP supplies. C14-16

The potential impacts of the DW Project on SWP and CVP water supplies should be analyzed and included in the final EIR/EIS by incorporating a DW Project reservoir into an SWP/CVP operations model such as DWRSIM.

DW Project Yield

Page 3A-9 of the DEIR/EIS states that the initial export values from DWRSIM have been adjusted by DeltaSOS to estimate additional exports that could be made without considering south-of-Delta demands and storage capacity. In addition to the hydrologic availability of inflow into the Delta, the availability of storage capacity and the variability of water demands on the system also affect DW Project yield determination. The opportunity to discharge stored DW Project water would depend on the demands and availability of storage south of the Delta, in addition to water quality requirements and export limits. C14-17

The supply analyses shown in Appendix A3 show years in which multiple diversion and discharge periods occurred during the same year. A review of these years shows that these occurrences follow a wet year. The fact that the previous year was wet increases the likelihood that other sources of water will be available (reservoir storage will be high) and that demand for DW Project water may be low. Therefore, the ability for these diversions to be stored or otherwise used is less certain than if they were available in periods following normal or dry years.

In the final EIR/EIS, these impacts on yield should be corrected through more accurate modeling, as described in the section above, or addressed in the discussion of yield from the DW Project. C14-17 cont'd

Analysis of the Project Alternatives Under Cumulative Conditions

The water supply effects of the DW Project alternatives under cumulative conditions were evaluated in the same manner as the current level alternatives, except that the full SWP pumping capacity at Banks Pumping Plant (10,300 cfs) was assumed to be available in any month under cumulative conditions. The DEIR/EIS correctly states that pumping at full SWP capacity may require implementation of DWR's South Delta Project and a revised Corps permit. It does not, however, address the possibility of a through Delta facility, isolated facility, or other Delta solution as a potential future project for the cumulative impact analysis. C14-18

Although the nature of such a project is speculative at this time, a Delta facility should at least be mentioned in the DEIR/EIS, even if only to state that a Delta facility was not analyzed because of the uncertainties regarding the project's design features and operations. In addition, the Los Vaqueros Reservoir Project was not addressed. This project should be included in the cumulative impact analysis.

Channel Hydrodynamics

The DEIR/EIS states that channel hydrodynamics in the general vicinity of the operations facilities (siphons and pumps, including discharge pumps) will be "within the range" of normal tidal hydraulics (velocity and stage) during both storage pumping and discharge (pages 3B-17 and 18). "Within the range" includes zero velocity, as well as significant ebb or flood velocities. The magnitude of proposed discharge will certainly influence channel hydraulics very significantly, including potentially exacerbating null velocity conditions in a variety of locations in the Delta. For example, these conditions are the driving force behind the barriers included in DWR's South Delta Project, which is designed to rectify or offset certain tidal and channel flow conditions which impact water quality. C14-19

The potential impacts of the DW Project on channel hydrodynamics, should be analyzed and discussed in the final EIR/EIS. A cumulative impact analysis on channel hydrodynamics which includes DWR's South Delta Project should also be discussed in the final EIR/EIS.

Levee Stability

Metropolitan is concerned about the stability of levees in the Delta. Failure of western Delta island levees would threaten both the supply and quality of SWP supplies. The DEIR/EIS states that the perimeter levees of the DW reservoir islands would be improved to bear the stresses and erosion potential of interior island water storage and drawdown. In addition, the DW Project proposes to maintain levee reliability through an ongoing monitoring and maintenance program. Metropolitan supports these measures.

However, Metropolitan is concerned about the levees on the DW islands, which were designed to be wet on one side and dry on the other. The final EIR/EIS should more thoroughly address levee slope stability in the situation where water is on both sides of the levee, during both rapid drawdown of DW Project storage and during seismic events. C14-20

Specific Comments

DW Project Objectives--The DEIR/EIS states on pages 2-1 and 2-2 that DW Project intentions are to: augment water supply for exports, increase the supply of high-quality water and freshwater releases for outflow from the Delta, and increase water available to meet environmental flow needs (fishery, wetlands, Suisun Marsh, and estuarine salinity). However, analyses of operations of the DW Project under the various alternatives only details increasing supply for exports and neglects the other stated project objectives. If these truly are DW Project objectives, the final EIR/EIS should include analyses identifying potential impacts and benefits of DW Project supplies being used for these other purposes. C14-21

Delta Export Pumping--The DEIR/EIS identifies on pages 2-5 and 2-6 the various restrictions on Delta export pumping. The final EIR/EIS should identify that further restrictions on export pumping, including take limits, may be imposed under both State and federal Endangered Species Acts, thus impacting DW Project discharge operations. C14-22

Discharges under Alternative 1--The DEIR/EIS states on page 2-7 that under Alternative 1, discharges would be treated as additions to total Delta inflow for the purposes of estimating the increased allowable "percent inflow" export limits. The validity of this assumption varies from month to month depending on what, if any, standard or flow requirement is controlling inflow to the Delta (e.g., upstream flow requirement, water C14-23

quality standard, or Delta outflow requirement). Depending on the controlling standard/requirement, DW Project discharges may or may not provide the same outflow benefit as Delta inflow. The final EIR/EIS should address the limitations of this assumption. C14-23 cont'd

Export Pumping of DW Discharges--In the final EIR/EIS, the following corrections should be made:

- Page 3A-9, fifth paragraph, last sentence, should be corrected to read, "Only export pumping capacity ~~that could not have been used by~~ available to the CVP and SWP ~~because of~~ within the 1995 WQCP export limits was simulated to be available for export pumping (wheeling) of DW discharges."

- Page 3A-15, second full paragraph, second sentence, should be corrected to read, "DW discharge for export would occur during months when SWP and CVP export pumping is not limited by the export-as-a-percent-of-inflow requirement contained in the 1995 WQCP ~~objectives~~." C14-24

- Table 3A-4, the title should be corrected to read "Monthly Percentiles for DeltaSOS Simulations for the No-Project Alternative ~~under Cumulative Conditions~~."

DWRSIM--On page A1-1, the second paragraph, DWRSIM is described as "the Delta operations model used by California Department of Water Resources (DWR)." DWRSIM is actually the reservoir operations planning model used by DWR. Other DWR models, including hydrodynamic models like DWRDSM, are used to model the Delta. This should be corrected in the final EIR/EIS. C14-25

Streams Modeled in DWRSIM--On page A1-3, the first sentence of the third paragraph reads, "Figure A1-1 shows the major streams and facilities that are included in the DWRSIM model." Figure A1-1 includes the Klamath, Eel, Russian, Salinas, Owens, Kern, Kaweah, and Tule Rivers, none of which are included in DWRSIM. Please make this correction in the final EIR/EIS. C14-26

Minimum Pumping during Cutbacks--It is stated in the second paragraph on page A3-5 that, "DeltaSOS simulations for DW Project impact assessment used a minimum export pumping value of 1,500 cfs." This value disagrees with the value shown in Table A3-2 of 2,000 cfs. Either the text or the table needs to be corrected in the final EIR/EIS. If the model simulations were done using 2,000 cfs, but the correct value is 1,500 cfs, the DeltaSOS simulations should be rerun. C14-27

Monthly Percentile Tables for the No-Project Alternative--Page A3-8, last paragraph, second sentence should be corrected to read, "Although there was at least one year with some available water in each calendar ~~year~~ month, most of the available water was simulated for November-March." C14-28

Monthly Percentile Tables for the No-Project Alternative under Cumulative Condition--Page A3-14, second paragraph, second sentence should be corrected to read, "For example, in October the total exports for No-Project Alternative cumulative conditions (bottom panel on page 5 of Table A3-18) were simulated to be greater than 11,921 cfs for about 30% of the years, and full SWP and CVP pumping capacity (~~11,900~~ 14,900 cfs combined pumping) was used in at least 10% of the years." C14-29

Adjustments to DWRSIM Delta Exports -- The total values in the last column of Table A3-4a (Initial DWRSIM Exports in TAF) added to those in the last column of Table A3-4b (DeltaSOS Adjustments) do not add up to the last column on Table A3-4c (DeltaSOS Adjusted Exports). It appears that one or more tables is incorrect and should be corrected. C14-30

Fishery Resources

Discharges Under Alternative 1

The scientific basis for the December 15, 1994 Accord attributes much of the value of Delta outflow to the pattern of Delta inflow and associated biological functions. These biological functions include the transport of eggs and larvae of listed, special status, and economically important species such as Delta smelt, splittail, longfin smelt, and striped bass. Delta inflow is also an important factor in establishing homing cues for migrating adult salmon and for outmigration, and imprinting cues for outmigrating juvenile salmon. Delta "inflow" from islands could impair, not contribute to, these important biological functions. This should be addressed in the final EIR/EIS. C14-31

Salmon Smolt Survival

The DEIR/EIS relies on the Salmon Smolt Survival Index (SSSI) model developed by the US Fish and Wildlife Service almost exclusively in its analysis of impacts to migrating juvenile salmon near or through the Delta (Chapter 3F). Although often cited, this model has been questioned extensively in recent years. The SSSI model relies on recapture in the Chipps Island Trawl of tagged salmon from various release groups in and upstream of the Delta under a variety of conditions and over several years, and imputes a "survival index" based on the recapture rate and the time fished by the trawl.

The problematic elements include: the lack of any consideration of tidal influences at or subsequent to release, invalid statistical assumptions, extremely low recapture rates in the trawl, pseudoreplication, insufficient sube–groups to compute a meaningful variance for the recapture rate, lack of sufficient representative water years for San Joaquin releases, and a variety of other problems. The model is presently undergoing a major revision effort which suggests that the use of it in DW Project analyses renders questionable outcomes. The final EIR/EIS should discuss the nature and extent of such issues and provide alternative analyses or interpretations. C14-32

Splittail

The DEIR/EIS relies on incomplete and outdated information on splittail in its analysis of the status of this species and project impacts (Chapter 3F). Readily available information on splittail spawning range and distribution of young–of–the–year was apparently not considered in the preparation of this document. For example, beach seine data collected annually since 1976 by the US Fish and Wildlife Service (primarily on the Sacramento River from Redding to the Delta, but including major Delta tributaries) shows a very robust population of this species throughout much of its historic range. The final EIR/EIS should include this and other relevant data on the status and distribution of splittail and should consider it in determining the likely project impacts on splittail. C14-33

Delta Smelt

In Chapter 3F (pages 3F-6 and 3F-22) and in Appendix F2, the DEIR/EIS relies almost exclusively on neutral particle tracking analysis to project the distribution and abundance of early life stages of Delta smelt in the vicinity of project pumps and siphons, and in "mortality" analyses for the assessments of project impacts. While it is not unreasonable to assume that early life stages of Delta smelt and other small fishes are limited in their swimming abilities, pulse "flushing" flow tests in the spring of 1994 demonstrated that early juvenile Delta smelt do *not* "go with the flow" and are apparently capable of volitional behavior comparatively early in their life cycle. The final EIR/EIS should take these and other readily available data into account, and include information relating to volitional fish behavior in the analysis of expected project impacts. C14-34

Fish Screening

The DEIR/EIS provides some detail on provisions for screening pumps and siphons to be used to bring water onto the reservoir and habitat islands. The screening facilities proposed are not appropriate for this application, however. Channel hydraulics will not be conducive to "encourage" screened fish to move away from the vicinity of the intake facilities over much of the intake cycle, due in large measure to tidal influences on C14-35

channel hydraulics and the pumping/siphoning rates proposed. Screening criteria, particularly approach velocity criteria, are based on performance testing which focuses on fatigue rates for various species and life stages. If some means to encourage fish to move away from screening facilities is not provided, the scientific basis for approach velocity criteria is violated and the criteria become biologically invalid. In the final EIR/EIS, alternative approaches to screening must be explored, with bypass or salvage options included. Alternative approaches must all consider factors such as the attraction of predators and interruption /alteration of fish migration. **C14-35 cont'd**

The provision for screen maintenance and cleaning is inadequate. Manual cleaning cannot provide sufficient assurances against "hot spot" formation, and is not sufficiently reliable for a facility of this diversion capacity. Assuming the fish lingering problem can be solved, the cylindrical screens proposed for the DW Project should be fitted with readily available air-burst or internal spray-bar cleaning systems. These systems should be fully automated, and the final EIR/EIS should account for the potential tendency for cleaned debris to accumulate near diversion facilities.

Egg and Larvae Entrainment

The DEIR/EIS treated entrainment of very small organisms, such as fish eggs and larvae, as an unavoidable adverse consequence, and provided no mitigation for this expected impact (Chapter 3F, page 3F-12). The vast majority of larvae and eggs, whether siphoned or pumped, can be expected to survive entrainment. Growth of entrained eggs and larvae (including species which are listed or proposed for listing under State and federal endangered species legislation) in either reservoir or habitat islands could be rapid due to a plentiful nutrient base and very low predator populations, larger fish having been excluded by screens. Upon draining of either reservoir or habitat islands, however, survival prospects can be expected to be diminished greatly due to predation. A significant number of fish, including listed species, will likely remain within the island to become stranded or concentrated in any open water areas. At a minimum, options for salvage operations should be analyzed in the final EIR/EIS for feasibility, and the relative project impacts disclosed. **C14-36**

Other Comments

No Project Alternative

The "No Project Alternative" as described in the DEIR/EIS (p. 3-4 and elsewhere) suggests that agriculture of greater intensity than currently exists will occur if the DW Project does not. The "No Project Alternative" should be a continuation of existing practices unless changes in existing practices absent the project can be supported with thorough and convincing economic and environmental analyses. The final EIR/EIS should include a "No Project Alternative" that reflects a continuation of existing land use practices, including the existing intensity and style of agricultural activities, or should present convincing arguments why a different future "no project" condition is more reasonable. C14-37

We appreciate the opportunity to provide input to your planning process. When available, please provide me with a copy of the final EIR/EIS, the mitigation monitoring and reporting plan, and the notice of determination. If we can be of further assistance, please contact me at (213) 217-6242 or Dirk Marks at (213) 217-6039.

Very truly yours,

Laura J. Simonek

Laura J. Simonek
Senior Environmental Specialist

MEM/NC:arb

Attachment

cc: Byron Buck, California Urban Water Agencies
David Kennedy, Department of Water Resources
Steve Macaulay, State Water Contractors

DETAILED WATER QUALITY COMMENTS ON DELTA WETLANDS PROJECT EIR/EIS

Prepared by Sr. Res. Chem. S. W. Krasner, Water Quality Division
11/30/95

INTRODUCTION

As a first priority, the accuracy of the analytical data developed during water quality experiments on the DW Project must be assessed before engineering decisions can be based on these data. Unfortunately, the DW Project utilized a testing procedure for trihalomethane formation potential (THMFP) that has been demonstrated to be inaccurate in waters containing more than 10 mg/L of dissolved organic carbon (DOC). More importantly, the DW Project contracted out water quality analyses (including THMFP testing) to laboratories that did not maintain good laboratory practices. Fortunately during the latter course of these studies, these problems were identified and split samples (for some aspects of the study) were run by Metropolitan's Water Quality Laboratory. However, at least during interim analyses of the data, the DW Project relied on assessing all of the data for the study in spite of quality control (QC) problems with the contracting laboratories. Of more concern is the accuracy of data generated by DW Project contract laboratories for earlier study samples that were not split with Metropolitan. To resolve that issue, Metropolitan did some experiments to try to reproduce conditions studied earlier by the DW Project to estimate the true results of those experiments. C14-38

The comments on the water quality aspects of the DW Project will be divided into four sections: (1) demonstration of the inaccuracy of the THMFP method used by the DW Project, (2) documentation of the QC problems experienced by the DW Project contracting laboratories, (3) presentation of water quality data generated by Metropolitan on split DW Project samples, and (4) discussion of a Metropolitan experiment to estimate the true results of DW Project experiments in which samples were not split with Metropolitan. Throughout these sections, an attempt will be made to interpret the accurate water quality data in terms of environmental impact issues in the Sacramento-San Joaquin Delta (Delta).

THMFP METHODOLOGY

The DW Project utilized a THMFP test that had been in use by the Department of Water Resources (DWR) at that time. The types of samples that are typically analyzed by DWR span a much wider range of DOC levels than is normally encountered by laboratories doing THMFP testing. DWR had developed a methodology that they believed could accommodate that wide range of DOC levels. Subsequently, tests were done that demonstrated the inaccuracy of the DWR method for water containing more than 10 mg/L DOC.

The DWR method used a constant chlorine dose (~120-125 mg/L) for their THMFP testing. This test was designed to meet the chlorine demand of all samples (low or high in DOC). Alternatively, Metropolitan tests all THMFP samples on a reactivity basis (utilizing the DOC and ammonia-nitrogen [NH_3-N] data), where:

Cl_2 dose = 3 x DOC + 7.6 x NH_3-N (on a mg/L basis)

The portion of the chlorine dose based upon the DOC content of the water was based upon experiments performed by Professor Gary Amy on samples collected in the Delta (including high-DOC agricultural drains) (G.L. Amy et al., "Evaluation of THM Precursor Contributions From Agricultural Drains," *Jour. AWWA*, 82:1:57, Jan. 1990). The additional chlorine was added to breakpoint chlorinate any raw water ammonia in the samples. THMs will not be formed if chlorine and ammonia are combined (i.e., as chloramines), so THMFP testing requires that ammonia (and other inorganic sources of chlorine demand) must be properly removed or oxidized.

Research on the effect of chlorine dose indicates that a low dose that achieves approximately a 3-mg/L residual at the end of the testing period will measure the more "readily-forming" THM precursors, whereas a high dose with a very large chlorine residual will also result in the measurement of the more "recalcitrant" THM precursors (J.M. Symons et al., "Measurement of THM Precursor Concentrations Revisited: The Effect of Bromide Ion," *Jour. AWWA*, 85:1:51, Jan. 1993). If a chlorine residual is not present at the end of the THMFP test, then the sample was underdosed and the THMFP level will be underestimated. Figure 5 from the Symons et al. paper in the *Jour. AWWA* (see attachment) shows the influence of the free available chlorine (FAC) residual on precursor measurement in California State Project water (SPW). When the SPW was underdosed, the total THM value obtained after a 7-day incubation ($TTHM_7$) was 65 percent of the $TTHM_7$ value when dosed (on a reactivity basis) to yield a 3-mg/L residual. Alternatively, when a 120-mg/L chlorine dose was used (as is done in the DWR method), the extremely high chlorine residual resulted in the production of 40 percent more $TTHM_7$ than measured for the 3-mg/L chlorine dose. A more appropriate term for the DWR method (in low-to-moderate DOC waters) is a "maximum" THMFP test. **C14-38 cont'd**

In high-DOC waters, however, the DWR method does not yield maximum THMFP results (see DWR Figure 16 attached). In this DWR experiment, for a State Water project (SWP) sample with low DOC (2.7 mg/L), the THMFP (as indicated by the level of THMFP carbon [TFPC]) was approximately the same for a 62.5- and a 125-mg/L chlorine dose, which implies that the 125-mg/L dose did achieve a maximum THMFP. However, the 125-mg/L chlorine dose did not achieve a maximum THMFP for the high-DOC agricultural drain samples. Empire Tract (DOC = 34 mg/L) and Bouldin #2 (DOC = 62 mg/L) achieved THMFP values with a 125-mg/L chlorine dose that were 73 and 48 percent, respectively, of their maximum THMFP values (based upon the 1250-mg/L chlorine doses). What is essential is that different samples--regardless of the DOC level--be chlorinated in a manner so that results between samples can be appropriately compared.

To better refine the DWR methodology, tests were performed at Metropolitan on a high-DOC agricultural drain from the Mandeville tract in the Delta (S.W. Krasner & M.J. Sclimenti, "Characterization of Natural Organic Matter: Disinfection By-Product Analysis" in Workshop Proceedings on *Natural Organic Matter in Drinking Water: Origin, Characterization, and Removal*, pp. 105-113, AWWA Research Foundation & AWWA, Denver,

greater than the SDS THM in the same water. It would be less only in the unlikely event that the FAC levels in the distribution system itself were greater than those chosen for the THMFP test. Some utilities have developed correlations between the THMPF and SDS THM tests for their locations. If water quality and treatment conditions are fairly constant, this may be possible, but any correlation would be site-specific.

Because the incubation conditions of the THMFP test may be varied to suit local conditions, standardizing more than an approach is not possible. The nineteenth edition of *Standard Methods*[5] is considering a "standard" THMFP test (like method 5710B, but having the FAC residual fixed) to allow comparisons of precursors from location to location followed by a general outline of the "variable" THMFP test.

Objective

Because Br^- has a considerable impact on THM speciation,[6] the purpose of this article is to highlight this impact on both the THMFP and SDS tests, particularly on their capability to predict THM species.

Methodology

Experimental procedures. This was a two-phase study. Phase one was conducted in the laboratory, where variables could easily be changed over a wide range, and phase two was conducted in the field, using real water samples to confirm the laboratory tests. During the laboratory phase, a commercial humic acid (AHA)* was used as the precursor material. Unpublished data collected several years ago in the University of Houston laboratories confirmed the work of others that AHA is quite different from natural aquatic humus. Nevertheless, upon chlorination it produces THMs at a rate similar to that for natural samples, and so it is a useful laboratory model. Furthermore, in this study, as noted previously, all of the laboratory results were confirmed in the field.

The stock AHA solution was prepared by weighing (to the nearest 0.1 mg) an amount of material that would produce a concentration in the stock solution of 1 mg/mL. The pH of the stock solution was then increased to about 10 with NaOH, and the solution was stirred for 24 h at room temperature (about 22°C). The stock solution was then filtered through a 0.45-µm-pore-diameter filter and stored at 4°C. All laboratory studies were performed on dilutions of this AHA stock solution in deionized water. In the laboratory study, precursor removal was simulated by diluting the solution with deionized water prior to free chlorination. Results were confirmed in the field at a demonstration-scale granular activated carbon (GAC) plant.

Free chlorine was provided using a stock hypochlorite solution in the laboratory and in the field samples. The laboratory samples were unbuffered, but the pH was measured at the beginning and end of each incubation. The pH changes during incubation were generally less than one pH unit. Most of the field samples were buffered with a borate buffer as described by Koch et al.[7] The pH changes in the laboratory did not interfere with interpretation of the data, because similar results were obtained from the buffered field studies. Free chlorine dosages and residuals were measured in the laboratory by method 4500-Cl D[2] and in the field by method 4500-Cl G.[2]

Data handling. The primary independent variable in this study was the molar ratio of the Br^- to the FAC concentration, because data show this ratio strongly affects THM formation and bromine substitution. The concentrations of both the Br^- and FAC change during the THM formation reaction. The Br^- is oxidized by the FAC, and the resulting hypobromous acid causes the substitution of bromine into THMs as well as into haloacetic acids and other disinfection by-products (DBPs). The hypobromous acid also acts as an oxidant, resulting in some recycling of the Br^-. In this study, the calculations of bromine uptake neglected all of the non-THM DBPs and only focused on the regulated THMs. Similar studies in the future that include the other DBPs would be quite interesting.

The FAC concentration ([Cl^+]) also changes as it oxidizes organic matter and reduced inorganic ions like sulfide, reacts with ammonia, and causes the substitution of chlorine into THMs and other DBPs. In this study, in the absence of any inorganic chlorine demand, the substitution of chlorine into the THMs was typically less than or equal to about 5 percent of the chlorine demand.

To treat data in this study, the following approach was used. Because the key variable, the Br^-/Cl^+ molar ratio, could not be calculated at every moment during the incubation, the initial Br^- concentration ([initial Br^-]) was chosen to be the numerator of the ratio. This concentration relates to the potential for bromine substitution into the THMs.

The laboratory and field samples tested contained neither ammonia nor reduced inorganic materials such as sulfide, ferrous iron, and so forth. Thus, the change in FAC concentration after one day of contact time was fairly slow and gradual throughout the remainder of the incubation period (Figure 1). Using the average FAC concentration during the incubation, ([initial Cl^+] + [final Cl^+])/2 = [average Cl^+] was representative of the FAC concentration influencing the THM formation reaction during incubation.

*Aldrich Chemical Co., Milwaukee, Wis.

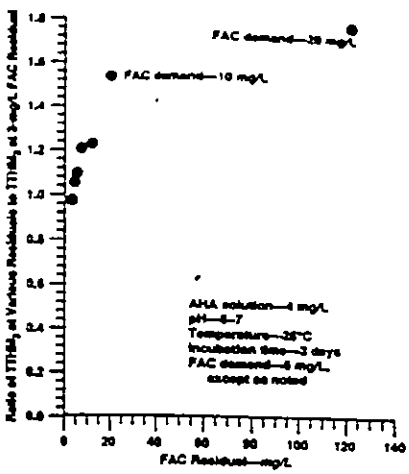


Figure 2. Influence of FAC residual on precursor measurement *(no Br^-, laboratory samples)*

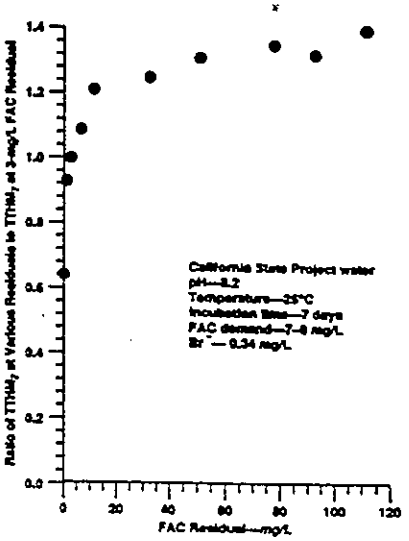


Figure 5. Influence of FAC residual on precursor measurement *(Br^- present)*

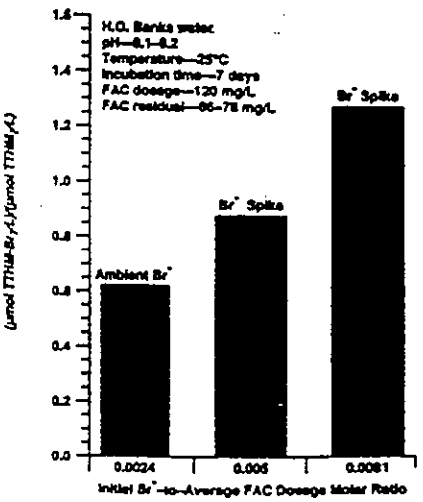
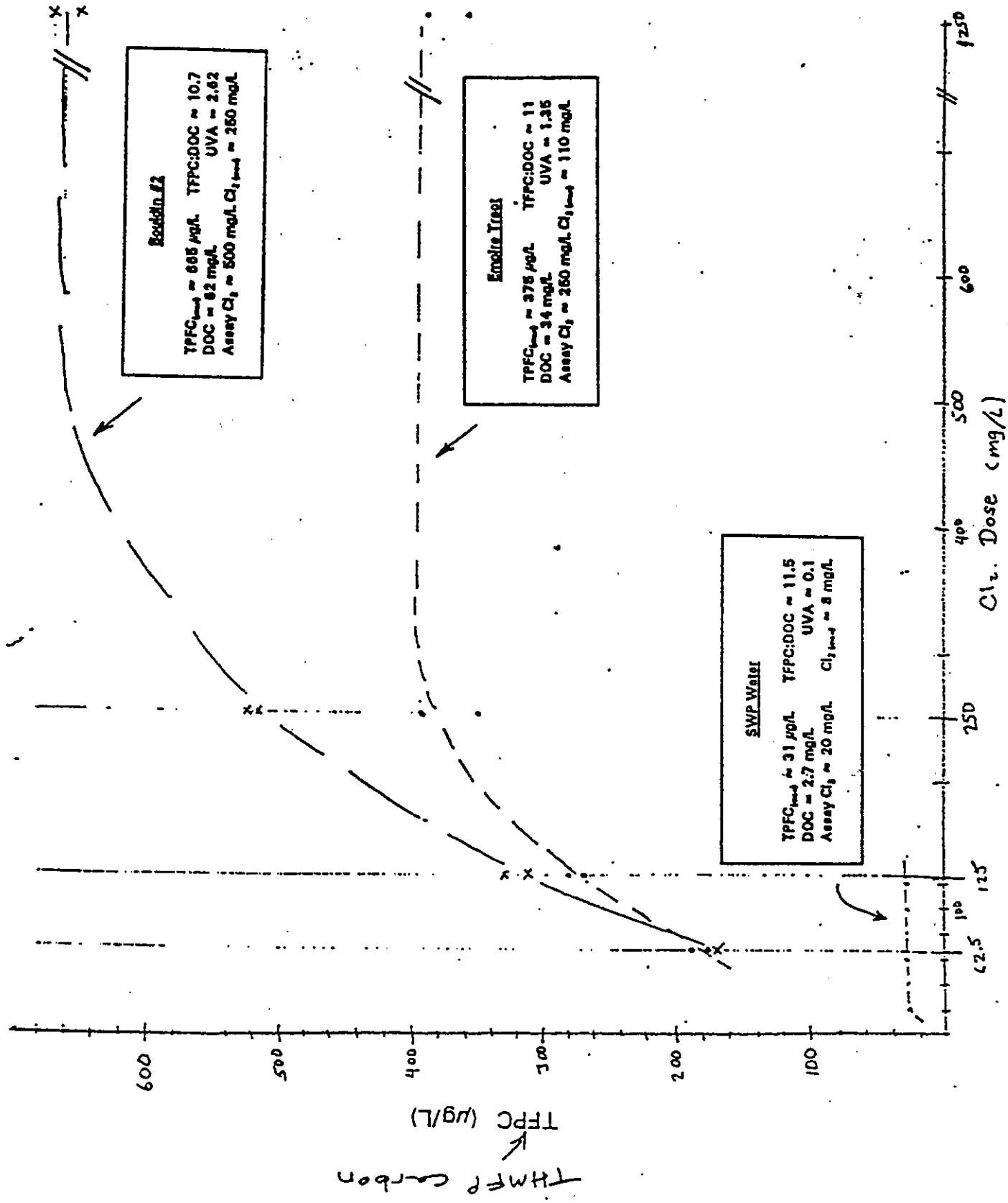


Figure 8. Influence of initial Br^-–to–average FAC dosage molar ratio on bromine substitution in THMs *(constant FAC dosage)*

C14-38 cont'd

J.M. Symons3.C-132.., Jan. 1993

DWR Figure 16. Comparative 7 day TFPC Tests



Colo., 1994). This sample had 48 mg/L DOC, 0.34 mg/L bromide, and 2.0 mg/L NH_3-N. Chlorination on a reactivity basis required a 160-mg/L dose. A 2.2-mg/L residual was attained; a positive residual would not have been realized if the chlorine dose had been based on DOC alone. A THMFP of 4422 µg/L (36.5 µmol/L) was produced under these conditions. When a 1600-mg/L chlorine dose was applied, the THMFP went up to 7949 µg/L (65.9 µmol/L). If the latter test represents a maximum THMFP, the former experiment only yielded 55 percent of the maximum.

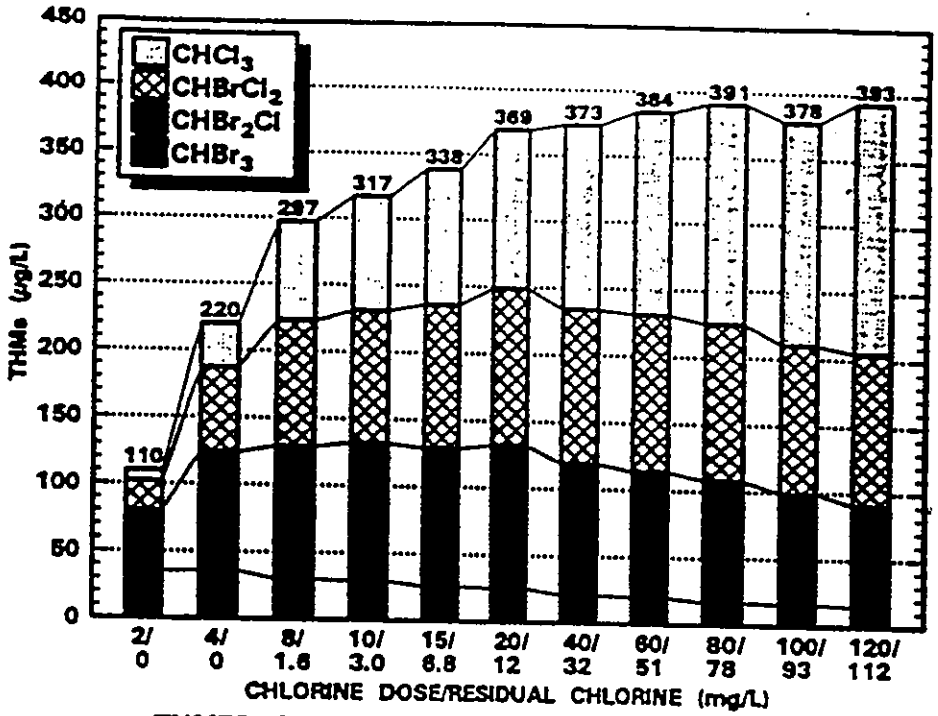
As an alternative to chlorinating a high-DOC water with an extremely high dose, dilution of the Mandeville agricultural drainage before chlorination was attempted. Samples were diluted with organic-free water spiked with 0.34 mg/L bromide in order to evaluate the effect of the chlorine-to-DOC ratio while maintaining a constant bromide-to-chlorine ratio. When diluted samples were chlorinated based on the DOC level (i.e., 3:1, in addition to meeting the ammonia demand), the THMFP divided by the dilution factor was consistently between 35 and 38 µmol/L (see Figure 2 of Krasner & Sclimenti paper attached). Alternatively, use of a constant chlorine dose--in this case, 120 mg/L--yielded THMFPs of 40 to 53 µmol/L after correcting for dilution, with the more diluted samples approaching, but not reaching, the maximum THMFP value obtained with a 1600-mg/L dose (i.e., 66 µmol/L). These data and other tests in a wide variety of Delta waters suggest that the chlorine-to-DOC ratio is significant in THMFP testing if the precursor levels of different samples are to be compared.

C14-38 cont'd

As a result of experiments at DWR and Metropolitan, DWR's THMFP test has been modified in that samples with more than 10 mg/L of DOC need to be diluted before chlorination with a 120 mg/L dose. In this manner, all samples are now chlorinated by DWR and its contracting laboratories with a Cl_2:DOC ratio of 12:1 or greater yielding maximum THMFP results for all samples.

An additional modification to the DWR THMFP method is that all samples are now chlorinated at a constant pH (~8) as is done in the Metropolitan method. Stevens and co-workers ("Formation and Control of Non-Trihalomethane Disinfection By-products," *Jour. AWWA*, 81:8:54, Aug. 1989) have demonstrated that chlorination pH significantly affects THM formation. For example, these researchers chlorinated raw Ohio River water for up to 144 h at pH 5, 7, and 9.4. After 144 h (6 days), the THM formation at pH 5 and pH 7 was approximately 26 and 73 percent, respectively, of the THM formation at pH 9.4 in the raw Ohio River water samples (see Figure 3 of Stevens et al. paper attached). In *Standard Methods for the Examination of Water and Wastewater* (17th and 18th editions, American Public Health Association, Washington, D.C., 1989 and 1992, respectively), it is recommended that THMFP tests be performed at a pH of 7.0 or 9.2.

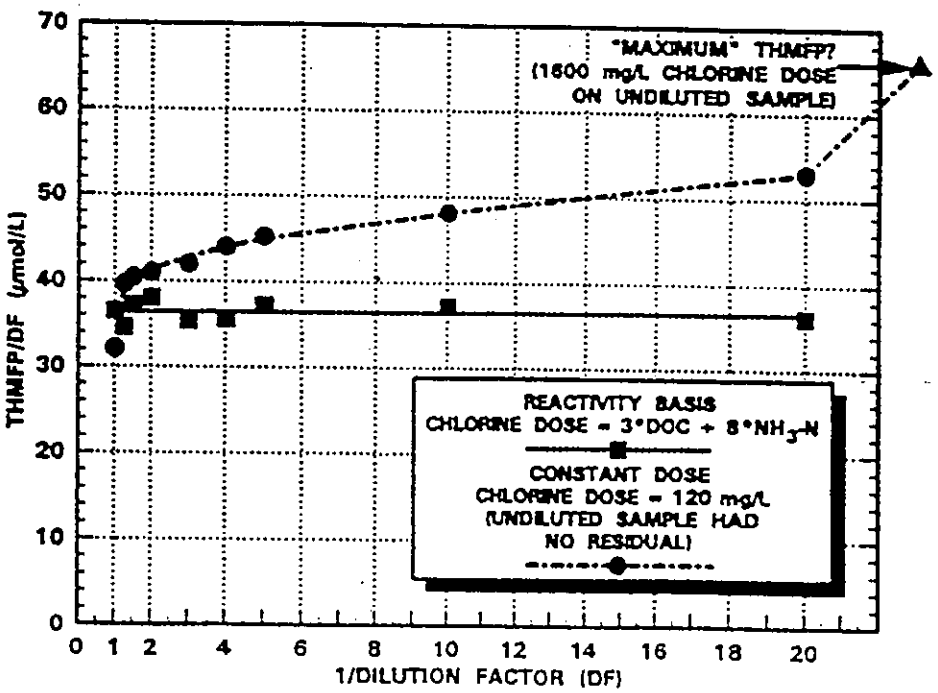
Because the DW Project used the older DWR THMFP method (120 mg/L chlorine dose for all samples regardless of DOC level, as well as no pH control of samples), the DW Project THMFP data must be analyzed in light of what we know today.



THMFP OF CALIFORNIA STATE PROJECT WATER

FIGURE 1

C14-38 cont'd



THMFP OF MANDEVILLE AGRICULTURAL DRAIN--
COMPARISON OF CHLORINATION METHODOLOGIES

FIGURE 2

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S.W. Krasner & M.J. Sclimenti, 1994

This water quality was considered to be typical of hard waters.

Lime-soda ash softening was carried out according to the processes described by Sawyer and McCarty.[8] Iron was used as a coagulant in the form of technical-grade $Fe_2(SO_4)_3 \cdot 3H_2O$, which is approximately 68 percent $Fe_2(SO_4)_3$. The proper dosage of coagulant in addition to the calculated lime and soda ash dosages was determined by jar testing. Jar testing also predicted the dosage of sodium hydroxide (NaOH) required to achieve pH 10.8 ± 0.1, as required for precipitation of $Mg(OH)_2$.

Adjustment of pH after softening was not by the usual carbon dioxide recarbonation but was accomplished by the addition of HCl. The HCl dosage was determined at the bench by acid titration of the settled and softened water.

Finally, conventional pH (neutral) coagulation employing alum was studied in run 3A.

Tables 1, 2, and 3 present mean operational data for these three pilot-plant runs. The data indicate good turbidity control, softening where applicable, and achievement of the desired pH range.

Chlorination experiments

Raw and filtered water samples were collected from pilot-plant runs 1A, 2A, and 3A in 30- to 40-L quantities.

Aliquots of each sample were buffered to three different pH values (5, 7, and 9.4) by first placing 80 mL of a buffer solution (a combination of 0.25 *M* borate and 0.25 *M* phosphate) into a 10-L bottle, then filling to the 4-L mark with either raw or filtered water. Either 1.0 *N* NaOH or 1.0 *N* H_2SO_4 was added to the buffered sample, which was stirred and monitored with a pH meter until the desired pH was reached. Each sample was then transferred to a 1-gal bottle until needed for further work.

The chlorine demand of each sample, as originally collected, was determined by a proposed standard method[9] for the determination of THM formation potential. The required amounts of chlorine, as determined previously, were then measured into 1-L bottles, using one bottle per experimental time period. Three experimental chlorination time periods were chosen for most of this work: 4 h, two to four days (dictated by convenience), and six to seven days. This required a total of six bottles per experimental time period: three bottles containing buffered raw water chlorinated at three different pH values and three corresponding bottles for filtered water. Chlorination reactions were allowed to proceed at 25°C until the reaction was quenched at the end of the given time periods.

Two procedures were used for stopping the chlorination reaction after the various time periods. Samples to be analyzed for dihaloacetonitriles (DHANs), chloropicrin (CP), 1,1,1-trichloropropanone (111-TCP), and trichloroacetonitrile (TCAN) were each poured into a 40-mL glass vial that already contained about three drops of ammonium chloride solution (5 g NH_4Cl/100 mL); the vial was then filled with sample, shaken, and neutralized to pH 7 by adding either 1.0 *N* H_2SO_4 or 1.0 *N* NaOH. For samples to be analyzed for TOX and the other DBPs, the chlorine residual remaining in the 1-L bottle was determined and was then destroyed by adding a slight excess of sodium sulfite; the pH was adjusted to between 5 and 6. Samples for THMs and chloral hydrate (CH) were then placed in separate vials, samples for TOX and haloacetic acids (HAA) were poured into separate 250-mL bottles, and the pH of the TOX sample was further reduced to 2 by adding nitric acid. All samples were stored at 4–6°C until analysis.

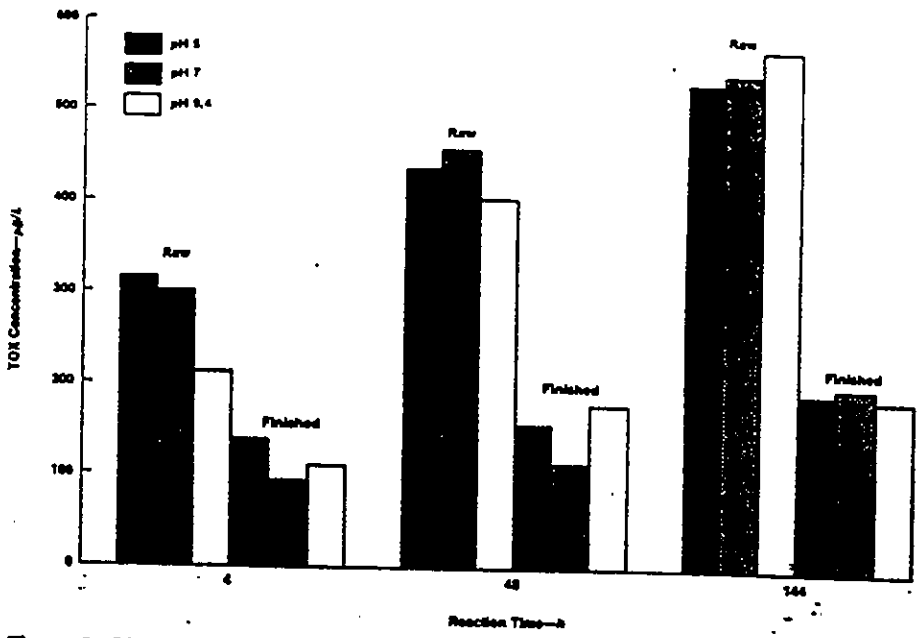

Figure 2. Variation of TOX with pH and time

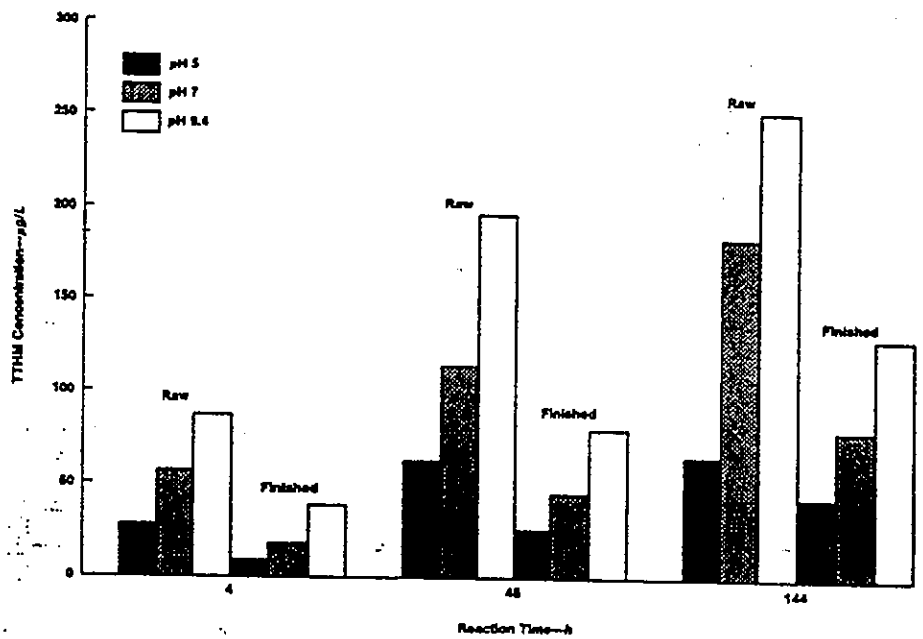

Figure 3. Variation of TTHMs with pH and time

C14-38 cont'd

Effects of pH and time

Only the data from run 1A are presented because the same trends were observed for and general conclusions apply to the other two runs.

Total organic halogen. Concentrations of TOX were reasonably independent of

Stevens et al. 1989

QC PROBLEMS WITH DW Project CONTRACTING LABORATORIES

THMFP Testing

Filtration of samples: Part of DWR's THMFP testing protocol (past and present) is to filter the water through a 0.45-μ filter to remove turbidity prior to chlorination.. The DW Project contracting laboratory doing THMFP tests in 1992 did not perform this step. Dissolved organic matter (as measured by DOC) will pass through a 0.45 μ filter. In many waters (including SPW), 90-95 percent of the organic matter is in the dissolved phase (D.M. Owen et al., *Characterization of Natural Organic Matter and Its Relationship to Treatability*, AWWA Research Foundation & AWWA, Denver, Colo., 1993). If a sample, however, contains suspended matter that presents a chlorine demand, not filtering the samples will result in a decrease in chlorine that is available to react with THM precursors.

More importantly, samples collected during a DW Project vegetative biomass experiment (1992) contained hydrogen sulfide (from the decomposition of sulfur-containing proteins), which has a high chlorine demand. Partial oxidation of hydrogen sulfide requires 2.1 mg/L of chlorine for each mg/L of hydrogen sulfide, whereas complete oxidation requires 8.5 mg/L of chlorine per mg/L of hydrogen sulfide (G.C. White, *The Handbook of Chlorination and Alternative Disinfectants*, 3rd ed., Van Nostrand Reinhold, New York, 1992). Because Metropolitan filtered split DW Project samples through a 0.45 μ filter to remove turbidity prior to chlorination, the hydrogen sulfide was removed during the vacuum filtration step. This was not the case for the DW Project contracting laboratory, which resulted in an underdosing of chlorine in those THMFP tests. **C14-38 cont'd**

Calibration of chlorine: Standard laboratory practice is to calibrate the chlorine solution used in THMFP testing to accurately determine the dose. This is particularly important because chlorine solutions decompose over time. To minimize the decomposition of the chlorine solution, it should be kept refrigerated. Gordon and co-workers (*Minimizing Chlorate Ion Formation in Drinking Water When Hypochlorite Ion is the Chlorinating Agent*, AWWA Research Foundation & AWWA, Denver, Colo., 1995) found that decreasing the temperature from 25 to 15°C decreases the rate of decomposition of chlorine bleach by a factor of more than 3.8.

Metropolitan stores chlorine bleach solutions used for THMFP testing at ~4°C, whereas the DW Project contracting laboratory stored their bleach at room temperature (~20°C). Metropolitan periodically recalibrates their chlorine solution, whereas the DW Project contracting laboratory did not. Thus, because the DW Project contracting laboratory did not properly store their chlorine solution and did not calibrate it, it is very likely that they underdosed THMFP samples.

Measurement of chlorine residual: It is standard laboratory practice to measure the chlorine residual at the end of the THMFP test. A THMFP test must have a positive residual at the end of the test to have a valid result. If the samples does not have a residual, then the sample was underdosed and the THMFP value will be low due to insufficient chlorination. The

use of a preset chlorine dose (e.g., 120 mg/L) that is assumed to be adequate to handle most samples can fail to yield a positive residual for all samples. The DW Project contracting laboratory had not originally measured chlorine residuals in these studies. When they started to check for chlorine residuals, they found that a positive residual was not present in some of the DW Project samples. Probably a combination of the reduced strength of the uncalibrated bleach solution stored at room temperature and the presence of a high chlorine demand (e.g., from the hydrogen sulfide in unfiltered vegetative biomass experiment samples) resulted in an insufficient chlorine dose and an underestimation of the THMFP of some DW Project samples.

THMFP pH: The DW Project THMFP samples were not pH adjusted as is required in *Standard Methods*. For some chlorinated DW Project samples, the DW Project contracting laboratory measured a pH ~6.5. As shown by Stevens and co-workers, an acidic pH produces significantly less THMs than at a neutral or basic pH (as run by Metropolitan).

Inconsistent THMFP results: Because the DW Project contracting laboratory did not use a standardized THMFP protocol with a calibrated chlorine solution, erratic results were generated by this laboratory. For example, during the vegetative biomass experiments, the DOC of samples (according to the DW Project contracting laboratory) ranged from 20 to 42 mg/L in barrel 3 (Metropolitan DOC measurements for these samples varied from 30 to 40 mg/L). Metropolitan's THMFP testing yielded values from 2588 to 2932 µg/L, whereas the DW Project contracting laboratory reported THMFP values of 52 to 8154 µg/L (R.T. Brown, "Water Quality Experiments on Potential Sources of Dissolved Organics and THM Precursors for the Delta Wetlands Project," draft memorandum, Jones & Stokes Associates, Inc., Sacramento, Calif., May 28, 1992). The variation in the reported DOC levels (a factor of two according to the DW Project contracting laboratory) can in no way explain the enormous variation in the DW Project contracting laboratory THMFP data (a factor of over 150). **C14-38 cont'd**

Other Water Quality Measurements

Bromide and chloride: The mass ratio of bromide to chloride in seawater is 0.0034 (H.U. Sverdrup et al., *The Oceans*, Prentice-Hall, Inc., Englewood Cliffs, N.J., 1942). Krasner and co-workers examined the bromide-to-chloride ratio in Delta sampling stations where the chloride was at or below 200 mg/L and the electroconductivity was less than 900 µmho/cm ("Quality Degradation: Implications for DBP Formation," *Jour. AWWA*, 86:6:34, Jun. 1994). A relationship with a correlation coefficient of 0.982 was obtained:

$$Br^- = 0.00327 \times Cl^- - 0.00496$$

This equation is relatively close to the relationship of bromide and chloride in pure seawater. It is clear from this equation that seawater is by far the major source of salinity in the Delta.

In the DW Project vegetative biomass experiment, Metropolitan found the ratio of bromide to chloride to vary from 0.0026 to 0.0032 over the course of this study, whereas the DW Project contracting laboratory found this ratio to vary from 0.0022 to 0.0051. The DW Project contracting laboratory reported for the February 27 and March 10, 1992 samplings (of barrel 1)

that the chloride decreased from 180 to 61 mg/L (a 66-percent decrease) and the bromide dropped from 0.39 to 0.31 mg/L (a 21-percent decrease). The DW Project explanation for these data was that rain during this period may have diluted the salinity. But these data suggest a significant dilution of the samples with bromide-laden water. Yet the Metropolitan data showed that the chloride and bromide remained relatively constant during this time period (i.e., 152-154 and 0.4-0.49 mg/L, respectively).

Anion/cation balancing: The anion and cation sums, when expressed as milliequivalents per liter (meq/L), must balance because all potable waters are electrically neutral. According to *Standard Methods*, for an anion sum of 3.0 to 10.0 meq/L, the acceptable difference is ±2 percent. For example, on March 10, 1992, the DW Project contracting laboratory reported that the chloride had drastically dropped (see discussion above). On that day, bicarbonate was not measured. During the sampling on April 14th, bicarbonate was measured at 120 mg/L. Because the conductivity on those two days was quite similar (748 and 773 µS/cm), it is likely that a similar bicarbonate level was present in March. Utilizing that bicarbonate value, the cation/anion balance on March 10th was 4.1 meq/L anions versus 6.7 meq/L cations, a 24 percent difference. Standard laboratory practice requires that the anion and cation measurements should have been redone to resolve this discrepancy. If the chloride value measured at Metropolitan on March 10th (which was consistent with the seawater ratio to bromide) is used in the anion sum, that value becomes 6.7 meq/L, which then exactly matches the cation balance.

Metropolitan RESULTS ON DW Project SAMPLES **C14-38 cont'd**

Vegetative Biomass Experiments

To evaluate the yield of disinfection by-product (DBP) precursors from plant biomass decomposition over time, an experiment was performed (R.T. Brown, 1992; Krasner et al., 1994). The experimental protocol involved the following parameters:

- Vegetation biomass samples (dominated by smartweed, watergrass, and swamp timothy) were collected from demonstration wetlands in the Delta. Biomass samples averaged ~435 g/m^2, with an average lignin content of 9.5 percent.

- Five 30-gal (114-L) containers were filled with water from the Delta. Barrels 1 and 2 received biomass clippings loaded to the natural density. Barrels 3 and 4 were loaded with a higher density of biomass. The fifth barrel did not receive any of the biomass clippings and was used as a control.

- The barrels were sampled every two weeks for a total of 10 weeks.

Table 7 from the Krasner et al. 1994 paper (see attachment) shows the results of the first sampling of the vegetative biomass experiment. In general, these levels stayed approximately the same over the remainder of the 10-week testing period. The control had a DOC level (reported in the *Journal* as total organic carbon [TOC]) of 4.3-4.9 mg/L, whereas the vegetative biomass barrels contained 12-17 mg/L and 30-40 mg/L DOC for the natural and

TABLE 6

Bromate formation as a function of TOC and bromide

TOC mg/L	Bromate—µg/L ≤0.01 mg Br⁻/L	0.1 mg Br⁻/L	0.2 mg Br⁻/L	0.4–0.5 mg Br⁻/L	0.7–0.9 mg Br⁻/L
1.2	<3	6	11	25	29
1.6	<3	7	12	23	40
2.2	4	11	19	36	53
2.9	<3	12	25	39	57
3.7	7	19	27	49	65

TABLE 7

Results of first sampling of delta wetlands vegetative biomass experiment*

Parameter	Control	Barrel 1	Barrel 2	Barrel 3	Barrel 4
TOC—mg/L	4.74	16.9	13.1	39.6	38.2
TOC—µmol/L	395	1,412	1,088	3,302	3,183
UV—cm⁻¹	0.129	0.397	0.390	0.611	0.544
Br⁻—mg/L	0.42	0.49	0.50	0.43	0.49
NH_3-N—mg/L	<0.03	0.07	0.03	0.21	0.07
Cl_2 dose—mg/L	14.2	51.4	39.4	120.7	115.6
Cl_2 residual—mg/L	3.75	6.0	1.75	21.5	22.75
TTHMs—µg/L	484	1,376	1,436	2,932	2,751
TTHMs—µmol/L	3.08	10.7	11.1	23.6	22.0
TTHM:TOC molar ratio—percent	0.78	0.76	1.02	0.72	0.69
HAA5—µg/L	119	923	1,000	1,495	1,470

*Seven days; 25°C; pH 8; THMFP test—Cl_2 dose = 3 × TOC + 8 × NH_3-N (mg/L)

els were the same regardless of the saturation period tested. These limited data indicate that the volumes of discharge water (from either the drainage of seasonal wetlands or agricultural operations) must be factored into the analysis of the effect of changing land management practices in the delta.

Summary and conclusions

The relationships among (1) chloride and bromide from seawater intrusion into the delta, (2) TOC loading in the delta, and (3) DBPs formed upon disinfection of delta waters have been studied. The main findings include:

- The ratio of chloride to bromide in delta waters is essentially the same as in pure seawater. Saltwater intrusion from the San Francisco Bay is the major source of bromide ions in exported delta waters.
- Agricultural drainage, particularly from tracts of land that are high in peat soil, is a major source of TOC and DBP precursors.
- Wetlands can also contribute TOC and DBPFP, both from vegetative biomass and from leaching of underlying peat soils. Although an agricultural operation may yield more TOC–DBPFP than an adjacent seasonal wetlands, the volumes of discharge water must be factored into the analysis of the relative contributions of each to the delta channel waters.
- There is a pressing need to limit all DBP precursors (both TOC and bromide) at municipal intakes because of the potential health effects of individual DBPs (e.g., $CHCl_2Br$ and bromate) and the cost to remove precursors once they are present in the water. In order to minimize health risks, bromide ion and TOC must be minimized wherever possible.

Finally, these experiments in the delta have resulted in (1) a better methodology to evaluate the source and effects of DBP precursors in the delta and (2) a better understanding of how different control measures—either in the delta or at the treatment plant—will affect the production of DBPs of health and regulatory concern. The data demonstrate that DBP control strategies should include watershed management as well as treatment plant processes. If California utilities are to meet future DBP standards, a way must be found to minimize water quality degradation in the delta.

This article should provide insights into the source and control of DBP precursors in other watersheds in the United States. Furthermore, the chlorination and ozonation study of a five-by-five matrix of TOC and bromide levels should provide for other utilities insights into the interplay of organic and inorganic precursors and disinfectants in DBP formation.

C14-38 cont'd

Acknowledgment

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References

1. US Environmental Protection Agency. Draft D–DBP Rule Language. USEPA Ofce. of Groundwater & Drinking Water, Washington, D.C. (Mar. 17, 1994).
2. State of California Department of Water Resources. delta Island Drainage Investigation Rept. DWR Div. of Local Assistance, Sacramento (June 1990).

elevated biomass densities, respectively. These samples were chlorinated at Metropolitan on a reactivity basis at pH ~8. The low- and moderate-DOC samples yielded chlorine residuals of 1.8 to 6.0 mg/L and the high-DOC samples (which required chlorine doses of 116-121 mg/L) yielded chlorine residuals of 22-23 mg/L. Upon chlorination, the control yielded 480-570 µg/L TTHMs. The chlorinated samples for the natural and elevated biomass yielded 1100-1500 µg/L and 2300-2900 µg/L TTHMs, respectively. The control (Delta water) had a 0.8-1.0 percent THM yield per unit of DOC (on a molar basis). The natural and elevated-density biomass THM yields were 0.8-1.1 and 0.7-0.9 percent, respectively. The vegetative biomass was a source of haloacetic acid (HAA) precursors as well.

As decaying vegetation is a source of humic material, the results described above are not surprising. Even the upstream channel waters can potentially pick up DOC and DBPFP from decaying vegetation in the channels of the Delta. These data do demonstrate that the wetlands vegetation can contribute DBP precursors into the Delta.

Soil Experiments

In addition, a soil experiment was performed (R.T. Brown, 1992; Krasner et al., 1994). The experimental protocol involved the following parameters:

- Soil samples were collected from the surface and from the bottom of a 3-ft (91-cm)-deep hole at two locations in the demonstration wetlands and from two locations in an adjacent agricultural field (both located on peat soils). C14-38 cont'd
- Each soil sample was split into three aliquots in order to perform three water extraction procedures each. Just enough deionized water was added to each aliquot to saturate the soil sample. The "pastes" were allowed to stand for durations of ≤1-2, 7, and 30 days before the soil/water samples were filtered (sets I, II, and III, respectively).

Water-paste saturation tests of peat soils from adjacent tracts of land indicated that more DOC and THMFP could be extracted from the soil of an agricultural tract than from that of a wetlands. In addition, there was more DOC and THMFP in the agricultural field surface samples (~100-190 mg/L DOC and ~8200-14000 µg/L THMFP) than in the agricultural field bottom samples (~40-100 mg/L DOC and ~2800-5000 µg/L THMFP); there was a smaller difference in the wetlands surface samples (~30-70 mg/L DOC and ~2100-5000 µg/L THMFP) and bottom samples (~20-70 mg/L DOC and ~1400-2700 µg/L THMFP). This may result, in part, from the constant exposure of soil to oxidative conditions during agricultural operations.

When the soil-test data are evaluated for a molar yield of THMFP per unit of DOC, these samples gave relatively comparable values (median value, 0.63 percent; 25th- and 75th-percentile values, 0.56 and 0.72 percent, respectively). In general, these levels were the same regardless of the saturation period tested. These limited data indicate that the volumes of discharge water (from either the drainage of seasonal wetlands or agricultural operations) must be factored into the analysis to evaluate the impact of changing land management practices in the Delta.

According to George Aiken (the U.S. Geological Survey) (Aiken & Cotsaris, "Soil and Hydrology: Their Effect on NOM [Natural Organic Matter]," 87:1:36, Jan. 1995), "Wetlands and areas rich in organic soils produce water with high DOC concentrations. In these environments the water moves directly from being in intimate contact with vegetation and organic detritus into streams with little or no contact with adsorptive materials. Wetlands are important sources of organic matter in many watersheds, particularly in areas with little relief.". The vegetative biomass and soil experiments demonstrate that the DW Project will result in the release of high levels of DOC and THM precursors into the Delta.

ADDITIONAL Metropolitan EXPERIMENTS TO EVALUATE DW Project

Demonstration Pond

In a demonstration-pond experiment performed by the DW Project over a 3-month period, water in a flooded wetland increased in DOC from 4.3 to 39 mg/L:

Sample Date[a]	DOC, mg/L	THMFP,[b] µg/L	~Cl_2 Demand,[c] mg/L
10/19/89	4.3	404	17.6
11/03/89	14.3	1862	47.6
11/10/89	16.9	1573	55.4
11/17/89	20.4	2075	65.9
11/30/89	30.7	3954	96.8
12/08/89	32.0	3417	100.7
12/15/89	32.1	3182	101.0
12/22/89	35.6	3662	111.5
12/29/89	38.6	2569	120.5
01/05/90	37.5	3220	117.2
01/15/90	38.4	2957	119.9

[a]During this sampling period, Br^- = 0.54-0.68 mg/L, NH_3-N and organic-N not measured. In subsequent testing, NH_3-N = <0.10-0.62 mg/L and organic-N = 1.0-1.9 mg/L.
[b]THMFP testing performed by DW Project contracting laboratory with 120 mg/L Cl_2 dose.
[c]Assuming chlorine demand ~3 x DOC + 7.6 x NH_3-N and that NH_3-N = 0.62 mg/L.

C14-38 cont'd

At this time, the THMFP tests were performed by a DW Project contracting laboratory using a 120-mg/L chlorine dose (without pH control). Although the THMFP values appear to have plateaued out approximately half-way through this testing, the DOC was still rising. The approximate chlorine demand of the samples was estimated based on a reactivity basis with the DOC and ammonia. These samples also contained organic-nitrogen, which also presents a chlorine demand. Approximately half-way through the testing, the theoretical chlorine demand (not including that presented by the organic-nitrogen) was fast approaching (and ultimately equaling) the chlorine dose. Thus, it is possible that the latter samples were underdosed. Based upon the laboratory practices of the DW Project contracting laboratory in 1992, it is possible that the laboratory used in 1989-1990 may have made similar errors in the THMFP testing. Without information on the laboratory practices used in this early work, the data appears suspect.

As discussed above, Metropolitan has done some THMFP experiments with an agricultural drain sample from Mandeville tract. Because this tract of land should be similar to the land in the DW Project, the Mandeville sample provided an opportunity to retrospectively revisit the DW Project demonstration pond experiment. By preparing different dilutions of the Mandeville agricultural drain, a range of DOC levels that are comparable to that evaluated in the DW Project demonstration pond were created. Because the bromide level was fairly constant during the demonstration pond experiment, organic-free water spiked with the same bromide level as the Mandeville agricultural drain was used to dilute the drain samples. In that way, the bromide level remained the same for all samples. THMFP tests were run on split samples using both the DWR methodology (constant 120-mg/L chlorine dose) and the Metropolitan technique (chlorine dosing on a reactivity basis).

The attached Table 1 shows the results for the Mandeville agricultural drain dilution series performed at Metropolitan. Regardless of whether the DWR or the Metropolitan THMFP test method was used, the THMFP went up as DOC went up as long as a positive chlorine residual was maintained. These data are plotted against the DW Project demonstration pond data (see attached Chart 1). Similar DOC levels and THMFP values are shown for either the demonstration pond or the agricultural drain. As discussed above for the soil experiments, although there was a higher amount of DOC and THMFP extracted from the soil in an agricultural field versus that extracted from a wetlands soil, the yield of THMFP per unit of DOC was the same. The results in Chart 1 demonstrate that whether one is examining 32 mg/L of DOC from an agricultural drain or a wetlands (both situated on peat soil tracts of land), that ~3000 µg/L of THMFP will be derived from that sample. The lines for the agricultural drain samples both demonstrate increases in THMFP with increases in DOC except for the 48-mg/L DOC sample using the original DWR THMFP method due to underdosing. On the other hand, the DW Project demonstration pond data are somewhat erratic and even show less THMFP for increases in DOC for a number of samples. Based on the poor QC used by other DW Project contracting laboratories, a laboratory audit should be performed on the laboratory that performed the demonstration pond THMFP samples. **C14-38 cont'd**

Effect of Wetlands Release into the Delta

An additional experiment was performed to evaluate the release of stored wetlands water (contribution from vegetative biomass only) into the Delta. SPW was sampled at Devil Canyon Afterbay (outflow of Silverwood Lake) on April 23, 1992 and used as a "reference" matrix. Filtered vegetative biomass samples from barrels 1 (normal biomass density) and 3 (elevated biomass density) on March 31-April 1, 1992 were used to represent the release of wetlands water. A "blended" sample was set up at a 9:1 ratio of SPW to vegetative biomass sample to evaluate the effect of a release of wetlands water that represented 10 percent of the flow in the Delta outflow at H.O. Banks.

In addition to performing THMFP analyses on the SPW, vegetative biomass samples, and the blends, simulated distribution system (SDS) testing was performed on SPW and the blends. SDS testing simulates actual drinking-water treatment plant operations (B. Koch

C14-38 cont'd

TABLE 1
Mandeville Agricultural Drain[a]

Sample Desciption[e]	DOC mg/L	NH_3-N mg/L	DWR Methodology[b]						MWD Methodology[c]					
			Cl_2 Dose mg/L	Cl_2 Res. mg/L	Cl_2:DOC Ratio[f]	THMFP µg/L	THMFP µmol/L	FP/DF[d] µmol/L	Cl_2 Dose mg/L	Cl_2 Res. mg/L	Cl_2:DOC Ratio[f]	THMFP µg/L	THMFP µmol/L	FP/DF[d] µmol/L
Undiluted	48.3	2.0	120	0	2.2:1	3899	32.1	32.1	160	2.2	3:1	4422	36.5	36.5
4/5 Dilution[g]	38.6	1.6	120	4.6	2.8:1	3854	31.7	39.6	130	8.2	3:1	3382	27.7	34.6
2/3 Dilution	32.2	1.3	120	15	3.4:1	3275	26.9	40.4	110	9.7	3:1	3032	24.8	37.2
½ Dilution	24.2	1.0	120	36	4.6:1	2520	20.5	41.0	80	8.3	3:1	2330	19.0	38.0
1/3 Dilution	16.1	0.67	120	59	7.1:1	1744	14.0	42.0	55	8.4	3:1	1482	11.8	35.4
¼ Dilution	12.1	0.5	120	75	9.6:1	1380	11.0	44.0	42	8.5	3:1	1136	8.90	35.6
1/5 Dilution	9.7	0.4	120	72	12:1	1153	9.04	45.2	32	6.4	3:1	966	7.44	37.2
1/10 Dilution	4.8	0.2	120	105	25:1	645	4.81	48.1	18	6.4	3:1	521	3.72	37.2
1/20 Dilution	2.4	0.1	120	103	50:1	387	2.65	53.0	7.2	2.2	3:1	301	1.81	36.2

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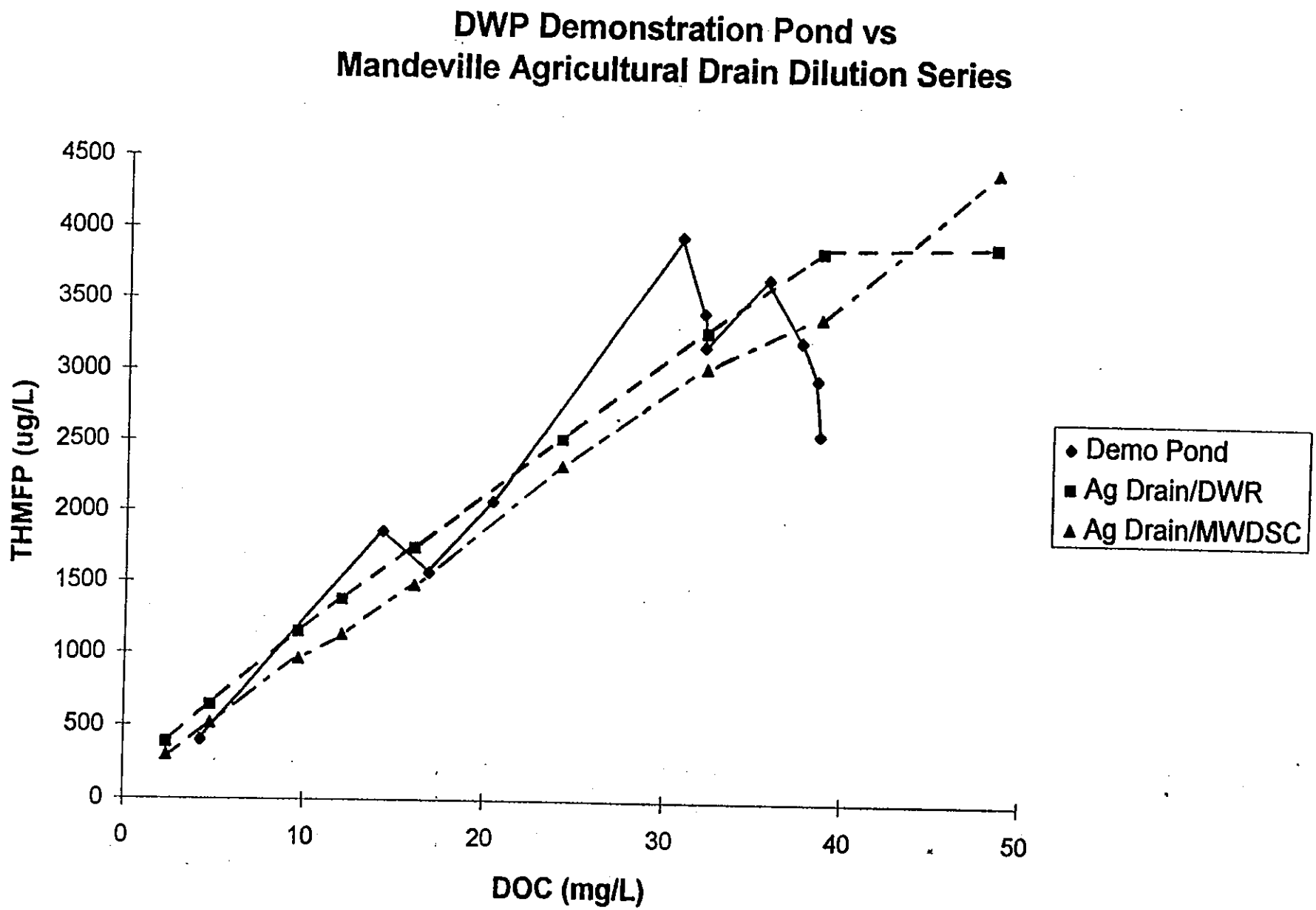
[a] Br^- = 0.34 mg/L and organic-N = 3.4 mg/L.
[b] Cl_2 dose = 120 mg/L.
[c] Cl_2 dose = 3 x DOC + 8 x NH_3-N.
[d] THMFP divided by dilution factor (DF); DF = 1 for undiluted sample.
[e] All analyses performed on 0.45 µ filtered samples.
[f] Weight ratio of Cl_2 to DOC after accounting for ammonia demand (i.e., 7.6 x NH_3-N).
[g] Diluted with organic-free water spiked with 0.34 mg/L Br^-; therefore, all samples had 0.34 mg/L Br^-.


DWP Demonstration Pond vs
Mandeville Agricultural Drain Dilution Series
THMFP (ug/L)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
10
20
30
40
50
DOC (mg/L)
Demo Pond
Ag Drain/DWR
Ag Drain/MWDSC

C14-38
cont'd

et al., "Predicting the Formation of DBPs by the Simulated Distribution System," *Jour. AWWA*, 83:10:62, Oct. 1991). The SDS tests were set up for a 3-h chlorination (as contrasted to the seven days used in the THMFP testing) with a 0.5 to 1.5 mg/L chlorine residual goal, as this simulates typical current treatment of Delta water with chlorine as the primary disinfectant and ammonia addition to form chloramines at the end of the plant to minimize further THM formation.

The results of the THMFP tests are shown below:

Parameter	SPW	Barrel #1	Barrel #3	SPW/Barrel 1	SPW/Barrel 3
DOC, mg/L	3.00	13.59	34.58	4.1	6.2
DOC, µmol/L	250	1132	2882	342	517
UV, cm^{-1}	0.087	0.389	0.625	0.117	0.141
Br^-, mg/L	0.29	0.40	0.42	0.30	0.30
NH_3-N, mg/L	0.11	0.05	0.40	0.10	0.14
THMFP,[a] µg/L	363	1193	2588	466	554
" theoretical[b]	---	---	---	446	586
THMFP, µmol/L	2.41	9.09	20.8	3.26	4.03
" theoretical	---	---	---	3.08	4.25
THMFP:DOC[c]	0.96%	0.80%	0.72%	0.95%	0.78%

[a]Cl_2 dose = 3 x DOC + 8 x NH_3-N.
[b]Theoretical THMFP of blended samples = 90 percent of THMFP of SPW + 10 percent of the THMFP of the vegetative biomass sample.
[c]Molar ratio.

C14-38 cont'd

Based on a mass balancing of the THMFP values of the SPW and vegetative biomass samples, the measured THMFP of the blended samples agreed to within six percent of their theoretical values.

The results of the SDS tests are shown below:

Parameter	SPW	SPW/Barrel 1	SPW/Barrel 3
Cl_2 dose, mg/L	4.56	5.5	6.7
Cl_2:DOC ratio[a]	1.2:1	1.2:1	0.91:1
Cl_2 residual, mg/L	1.35	1.49	1.55
TTHMs, µg/L	114	136	147
TTHMs, µmol/L	0.649	0.832	0.954
TTHMs/THMFP[b]	27%	26%	24%
TTHM:DOC[b]	0.26%	0.24%	0.18%

[a]Weight ratio of Cl_2 to DOC after accounting for ammonia demand (i.e., 7.6 x NH_3-N).
[b]Molar ratio.

In SDS tests, the chlorine doses are much lower than that used in THMFP testing. In these SDS tests the Cl_2:DOC ratio was ~1:1 (unlike the 3:1 ratio used in Metropolitan's THMFP testing). As a result, less THMs are formed in SDS tests (in this case, 24-27 percent of the THMFP

values). However, the SDS tests yield THM values that match actual plant and distribution system data (Koch et al., 1991).

In other studies, Krasner and co-workers demonstrated that an agricultural drain sample could be used as a DOC spike (Krasner et al., 1994). SDS testing was used to compare a sample from H. O. Banks to a synthetic sample consisting of 90 percent Sacramento River water sampled at Greene's Landing (upstream of the Delta) and 10 percent agricultural drainage water (35 mg/L DOC; sampled from a peat-soil tract of land), with an appropriate bromide spike (see attached Table 3 from Krasner et al. paper). The synthetic sample matched the H. O. Banks sample in DOC (reported at TOC in the *Journal*), ultraviolet (UV) absorbance measured at 254 nm, and bromide levels, and similar amounts of individual and TTHMs were produced.

These data demonstrate that the release of high-DOC waters with high-THMFP values (from either agricultural drains or a wetlands) in the Delta will increase the THM precursor loading (as measured by DOC, UV, or THMFP) in exported water. Moreover, SDS testing has demonstrated that such releases will significantly increase the THM levels produced during the chlorination of Delta waters.

IMPACT OF DW Project ON COMPLIANCE WITH DRINKING-WATER REGULATIONS

Regulatory Background

C14-38 cont'd

As part of the draft Disinfectants/DBP (D/DBP) Rule, there will be Stage 1 and 2 maximum contaminant levels (MCLs) for TTHMs at 80 and 40 µg/L, respectively; plus MCLs will be established for other DBPs (Environmental Protection Agency [EPA], National Primary Drinking Water Regulations; Disinfectants and Disinfection Byproducts; Proposed Rule. *Federal Register*, 59:145:38668, July 29, 1994). In addition, there will be a treatment requirement in Stage 1 for surface waters to remove DBP precursors through enhanced coagulation or softening (S.W. Krasner & G.L. Amy, "Jar-Test Evaluations of Enhanced Coagulation," *Jour. AWWA*, 87:10:93, Oct. 1995). The removal of TOC will be used as a treatment performance indicator for compliance with the precursor removal criteria. The draft rule has proposed that advanced precursor removal technologies (specifically the use of granular activated carbon [GAC]) will be best available technology for Stage 2.

During the development of the D/DBP Rule, the issue of watershed management for the control of DBP precursors was discussed. The rule, however, has no specific provisions for watershed controls because of statutory limitations, as well as the lack of control that most utilities have over land use. However, the preamble to the rule indicated that watershed protection is highly desirable and should be pursued whenever possible. In addition, the rule offers incentives for watershed protection by providing waivers on certain aspects of the regulations to systems treating low-DOC waters. For example, the enhanced coagulation requirements for DBP precursor control are not required for systems treating water with a TOC of 2.0 mg/L or lower. In addition, an Information Collection Rule (ICR) (EPA, National Primary Drinking Water Regulations: Monitoring Requirements for Public Drinking Water Supplies: Cryptosporidium, Giardia, Viruses, Disinfection Byproducts, Water Treatment Plant Data and

TABLE 2
Testing of delta waters for THMFP*

Parameter	Channel Waters: Greene's Landing	Channel Waters: Vernalis	Channel Waters: H.O. Banks	Agricultural Drains: Upper Jones	Agricultural Drains: Bacon Island	Agricultural Drains: Empire Tract
TOC—*mg/L*	1.86	2.81	4.72	6.63	10.93	30.89
TOC—*μmol/L*	155	234	393	552	911	2.574
UV—cm^{-1}	0.040	0.077	0.148	0.247	0.454	1.35
UV/TOC—cm^{-1}/*mg/L*	0.022	0.027	0.031	0.037	0.042	0.044
NH_3-N—*mg/L*	0.65	0.04	0.15	0.79	0.98	0.62
Br^-—*mg/L*	0.03	0.36	0.14	0.34	0.34	3.1
Cl_2 dose—*mg/L*	10.8	8.60	16.1	25.8	40.8	98.9
Cl_2 residual—*mg/L*	2.06	2.16	4.32	3.24	2.88	2.88
TTHMs—*μg/L*	144	360	421	731	1,177	4,526
TTHMs—*μmol/L*	1.16	2.27	3.23	5.37	9.16	31.3
HAAs—*μg/L*	77	101	215	316	682	1,872
TTHM:TOC—*μmol/μmol, percent*	0.746	0.970	0.822	0.973	1.01	1.22
DCAA:$CHCl_3$—*μg/μg, percent*	32.5	38.1	35.7	34.2	36.9	39.2
TCAA:$CHCl_3$—*μg/μg, percent*	27.6	21.2	28.5	30.0	34.7	33.3

*Seven-day, 25°C, pH 8 THMFP test—Cl_2 dose = 3 × TOC + 8 × NH_3-N (mg/L)

TABLE 3
Comparison of synthetic delta sample* with one from H.O. Banks pumping plant

Parameter	H.O. Banks Sample	Synthetic Sample
TOC—*mg/L*	3.65	3.53
UV—cm^{-1}	0.122	0.126
Br^-—*mg/L*	0.48	0.48
3-h SDS THM—*μg/L*		
$CHCl_3$	12	13
$CHCl_2Br$	34	36
$CHClBr_2$	67	70
$CHBr_3$	37	38
TTHMs	150	157
24-h SDS THM—*μg/L*		
$CHCl_3$	34	34
$CHCl_2Br$	65	73
$CHClBr_2$	102	117
$CHBr_3$	36	40
TTHMs	237	263

*Synthetic water = 90 percent Greene's Landing + 10 percent agricultural drainage + bromide spike sample

Br^- values for the utility with atypically high Br^- levels were excluded (i.e., 3.0 mg/L), linear regression yielded the following equation (with a correlation coefficient *r* of 0.86):

$$Br^- = 0.0034 \times Cl^- - 0.0071 \qquad (6)$$

It is significant that high Br^- levels were detected not only at utilities affected by saltwater intrusion, but at inland utilities as well. Thus, the Br^- to Cl^- relationship tended to be similar to that in seawater (Eq 2).

More recently, a nationwide Br^- study was conducted at 100 utilities.[19] The median Br^- occurrences for 68 large and 20 small utilities (based on a population cutoff of 50,000) were 0.042 and 0.029 mg/L, respectively, whereas the median Br^- level for 12 targeted utilities with known Br^- problems was 0.190 mg/L. In this study, there was no clear common Br^--to-Cl^- relationship, although the median ratio was similar to that of seawater. When surface water (river and lake) samples (from both targeted and random utilities) were examined, the median, 90th percentile and 95th percentile for Br^- occurrence were ~0.03, ~0.14, and ~0.4 mg/L, respectively.[20] The Br^- levels in the delta outflow have typically been in the 90th to 95th percentile of the nationwide occurrence.

Sources of DBP precursors. Table 2 shows the TOC and UV absorbance (at 254 nm) of each water. In addition, the UV-to-TOC ratio indicates the tendency of the organic matter to form THMs. The TOC, UV, and UV-to-TOC data show that the two rivers entering the delta (particularly the Sacramento River) pick up organic matter in passing through the delta. The agricultural drain on the peat-soil tract of land (Empire Tract) had the highest level (31 mg/L TOC) of organic matter, and that material had a higher reactivity based on the UV-to-TOC ratio.

C14-38 cont'd

Chlorinated channel waters produced THMFPs of 144–421 μg/L (1.2–3.2 μmol/L), whereas the agricultural drains contained 731–4,526 μg/L (5.4–31 μmol/L) THMFP. As Sacramento River water passed through the delta, the THMFP (on a molar basis) increased almost threefold in traversing the distance from Greene's Landing to the H.O. Banks pumping plant. Empire Tract had 27 times more THMFP than Greene's Landing, so the significant contribution of peat-soil agricultural drainage is clear. The molar yield of THMs per unit of TOC was 0.75–1.2 percent; this yield tended to increase with increasing UV-to-TOC ratio. However, samples high in Br^- will tend—even on a molar basis—to have a higher yield of THMs. This may explain the higher yield for Vernalis (0.36 mg Br^-/L) than for H.O. Banks (0.14 mg Br^-/L) and the very high yield for Empire Tract (3.1 mg Br^-/L).

The HAA5 formation potential (HAA5FP) was 77–215 μg/L for channel waters and 316–1,872 μg/L for agricultural drains. Although HAA5 does not represent total HAAs (because not all of the nine HAA species were measured), comparisons can be made between di- or trichloroacetic acid (DCAA or TCAA) and chloroform ($CHCl_3$): the DCAA-to-$CHCl_3$ weight

Other Information Requirements; Proposed Rule. *Federal Register*, 59:28:6332, Feb. 10, 1994) will require surface-water systems that serve >100,000 people and treat water with a TOC>4.0 mg/L to do a bench or pilot study to evaluate an advanced precursor removal technology (either GAC or membranes) (S.W. Krasner et al., "Bench and Pilot Testing under the ICR," *Jour. AWWA*, 87:8:60, Aug. 1995). Such advanced precursor removal technologies may be needed to meet Stage 2 requirements.

Impact of DW Project on Compliance

Conventional treatment of Delta water will be unable to meet the proposed requirements in the D/DBP Rule (Krasner et al., 1994). California utilities are exploring and installing new (and costly) treatment technologies to be able to comply with more stringent disinfection and DBP requirements. The proposed rule will add a requirement to remove TOC in addition to meeting MCLs on DBPs such as THMs.

Wetlands have been demonstrated to contribute DOC and DBPFP, from both vegetative biomass and leaching from underlying peat soils. Although an agricultural operation may yield more DOC/DBPFP than an adjacent seasonal wetlands, the volumes of discharge water must be factored into the analysis of the relative contributions of each to the Delta channel waters. In evaluating a project of this nature, the volume of water and, thus, the total mass of DOC and THMFP leaching from the peat soils and entering the Delta water supply must be considered. Because drainage flow rates are, as yet, inadequately documented for agricultural drains, it is not possible to generate accurate estimates of mass loadings of the current agricultural practices. Additionally, there are inadequate data to predict the effects on DOC and THMFP of seasonal inundation of peat soil. There are limited data suggesting that, for peat soils, the concentration of DOC/THMFP in the water is a function of the duration of inundation. These limited data imply seasonal impoundments on peat soils could result in a significant increase of the DOC content of the impounded water. **C14-38 cont'd**

The DW Project EIR/EIS predicts a reduction in DOC and THMFP for the proposed DW Project as compared to the current agricultural operations. The data and assumptions supporting this conclusion are, however, equivocal. It is likely that the water quality effect of this project will probably not result in any significant improvement in the quality of water exported from the Delta.

ncdeltch/corres

Metropolitan Water District of Southern California

C14-1. See responses to Comments C14-2 through C14-37 for discussions of specific concerns expressed in this letter.

C14-2. MWD participated in the analytical lab measurements for the Delta Wetlands experiments. As indicated on page C3-9 of Appendix C3 of the 1995 DEIR/EIS, the THMFP values measured by MWD were considered reliable and were used in the assessment of results of the 1992 water quality experiments presented in this appendix; the THMFP values determined by another analytical laboratory were determined to be unreliable and were rejected. The measurement difficulties are described fully in Appendix C3.

Since this comment was received, an updated analysis of potential project effects on DOC and THM formation has been performed; the methods and results are presented in the 2000 REIR/EIS. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for a discussion of the updated analysis. Additionally, the WQMP negotiated by Delta Wetlands and CUWA addresses the concerns of CUWA and its member agencies about the potential effects of Delta Wetlands Project operations on THMs; the WQMP is included in the Delta Wetlands–CUWA agreement in the Appendix to the Responses to Comments.

C14-3. The commenter provides information about changes in analytical methods for estimating THMFP from the method described in Appendix C2. THMFP, however, was not used as an impact assessment variable in the 1995 DEIR/EIS or the 2000 REIR/EIS; rather, the relative effects of Delta Wetlands Project operations on concentrations of the THM precursors DOC and bromide were analyzed. The expected THM concentrations in treated drinking water were also used as an impact assessment variable. Therefore, THMFP measurement problems do not affect the impact assessment conclusions. See also response to Comment C14-2.

C14-4. THMFP measurements were not directly used in the impact assessment. The experiments described in Appendix C3 were designed to determine the following:

the expected contribution from decomposition of wetland vegetation to levels of DOC and associated variables in ponded water and

the relative contributions of DOC and associated variables that may be expected from agricultural and wetland soils.

The effects of Delta Wetlands Project operations on levels of DOC and bromide were used as impact assessment variables. The analysis of project effects on DOC and THM was updated as part of the 2000 REIR/EIS. See also response to Comment C14-2 and Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

C14-5. The commenter is referring to information in the 1995 DEIR/EIS that was updated by the 2000 REIR/EIS. Chapter 4 of the 2000 REIR/EIS (see Chapter 3C in FEIS Volume 1) included an updated analysis of potential project effects on DOC concentrations in Delta exports and THM concentrations in treated drinking water. As in the 1995 DEIR/EIS analysis, both were found to be significant impacts. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

C14-6. The commenter is referring to information in the 1995 DEIR/EIS that was updated by the 2000 REIR/EIS. The DOC assessment described in Appendix C4 of the 1995 DEIR/EIS estimated a total DOC load from the reservoir islands of 12 grams per square meter (g/m^2) per year, which is approximately twice that measured from wetland vegetation and equal to the average load from Delta agricultural drainage. In other words, no reduction from current agricultural DOC loading was assumed in the 1995 DEIR/EIS analysis.

Chapter 4 of the 2000 REIR/EIS (see FEIS Volume 1, Chapter 3C) provided an updated evaluation of potential project effects on DOC concentrations in Delta exports based on a wide range of values for potential DOC loading from the reservoir peat soils. The water quality impact analyses in both the 1995 DEIR/EIS and the 2000 REIR/EIS found the potential effect of project operations on DOC to be significant. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

C14-7. The commenter is referring to information in the 1995 DEIR/EIS that was updated by the 2000 REIR/EIS. Chapter 4 of the 2000 REIR/EIS (see FEIS Volume 1, Chapter 3C) included an updated analysis of potential project effects on DOC concentrations in Delta exports and THM concentrations in treated drinking water. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

C14-8. See responses to Comments B7-16 and B7-18 and Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

C14-9. The commenter is referring to information in the 1995 DEIR/EIS that was updated by the 2000 REIR/EIS. Table 4-5 in Chapter 4 of the 2000 REIR/EIS (see Table 3C-13 in FEIS Volume 1, Chapter 3C) presented an updated comparison of DOC loading measurements and estimates, including estimates presented in the 1997 water right hearing. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for a description of the updated analysis of project effects on DOC and THM concentrations presented in Chapter 4 of the 2000 REIR/EIS, mitigation of project effects, and protections provided by the Delta Wetlands Project WQMP.

C14-10. Data do indicate that there is a large difference between submerged soils and agricultural soils. Most of the peat in the Delta is below the water table and is therefore a submerged peat soil. U.S. Geological Survey (USGS) research on groundwater quality in the Delta peat soils suggests that only aerobic peat soils produce high levels of carbon dioxide (evidence of oxidation).

Results of the seasonal storage experiment, described on page C3-7 in Appendix C3 of the 1995 DEIR/EIS, indicated that very little leaching occurred during the 3-month period of flooding. The experiment started with ponds where vegetation had decayed. High concentrations of DOC appeared immediately upon flooding, but DOC and salt concentrations did not increase during the 3-month period, suggesting that the peat soil leaching, which continued for those 3 months, was not sufficient to increase concentrations substantially.

The updated impact assessment of DOC loading from flooded peat soil presented in the 2000 REIR/EIS (see Chapter 3C of FEIS Volume 1) included the results of DWR's SMARTS experiments, as described in response to Comment B7-9. The SMARTS experiments did not provide any detailed measurements of anaerobic chemistry for the flooded peat soils, but they did indicate that some peat soils will produce high concentrations of pore-water DOC.

C14-11. The study of the potential presence of agricultural chemical residues in Delta Wetlands Project island soils is described in Appendix C6, "Assessment of Potential Water Contaminants on the Delta Wetlands Project Islands", of the 1995 DEIR/EIS. This study began with a comparison of the list of agricultural chemicals that had been used on the project islands to regulatory agencies' lists of chemicals that pose risks to human health or the environment but are *not* known to leach to groundwater, and to lists of pesticides suspected of leaching to groundwater.

"Screening for Target Pesticides" on page C6-2 of the 1995 DEIR/EIS and "Other Pesticides Posing Environmental or Health Risks" on page C6-5 describe the process of screening for carcinogens and other toxic chemicals *not* considered by the California Department of Food and Agriculture and EPA to have the potential to leach to groundwater, but considered to pose risks to human health or the environment if found to be present in soils. This list of carcinogens and other toxic chemicals was compiled using information from California Department of Health Services, DWR, the SWRCB, and DFG. The surface soil testing described in Appendix C6 was conducted to determine whether any of the chemicals known to have been used on the project islands and appearing in this screening list were present in the project island soils; subsurface soil testing was performed to determine the presence of those chemicals with leaching potential.

The results of the surface soil testing are described for each island on page C6-7 of the 1995 DEIR/EIS, and conclusions about the potential for contamination of water applied to the Delta Wetlands habitat islands or stored on and discharged from the reservoir islands are described on pages C6-7 through C6-10. No significant risks to human health or wildlife were identified. See also response to Comment C14-13 below.

There are some sites of potential contamination from past agricultural operations and waste disposal operations on the Delta Wetlands Project islands; therefore, Mitigation Measure C-8 was recommended to address the unlikely event of the release of pollutant residues into stored water. This measure recommends that preliminary site assessments

be conducted at potential contamination sites, in addition to those already performed for the impact analysis. Site cleanup or remediation would be necessary if any pollutant sources were identified. Monitoring for pesticides on the first filling of the reservoir islands and before discharges begin would ensure that chemicals of concern would not be released into the Delta as a result of project operations.

C14-12. The 1995 DEIR/EIS identified the potential need for increased mosquito abatement under project operations in Chapter 3N, "Mosquitos and Public Health". As described on page 3N-5 of the 1995 DEIR/EIS (page 3N-5 of FEIS Volume 1), the San Joaquin County Mosquito Abatement District (SJCMAD) and Contra Costa Mosquito Abatement District (CCMAD) have reduced their reliance on pesticides as part of their mosquito abatement programs and rely on biological control, ecological control, and source reductions. Among the pesticides used by SJCMAD and CCMAD, methoprene and Bti are preferred. Methoprene dissipates from the environment within 48 hours of application. Bti is a bacterial, rather than chemical, larvicide. All mosquito control measures, including application of pesticides, would be conducted in accordance with EPA and state regulations.

C14-13. Findings of the experiments described in Appendix C3 of the 1995 DEIR/EIS indicate that storage of water on Delta peat soils is not likely to produce unacceptable concentrations of DOC, algae, and other contaminants. The Secchi depth reading recorded during the flooded wetland experiment (Table C3-3 in Appendix C3 of the 1995 DEIR/EIS) indicated that significant suspension of sediment did not occur during the 3-month period of the experiment. This experiment also required scientists to walk across the pond every 2 weeks to collect samples. The peat bottom was observed to be solid, and it remained undisturbed during these sampling procedures. See response to Comment C14-10 regarding leaching from peat soils. See also response to Comment C9-32 regarding wind mixing and increased turbidity.

Detailed sediment resuspension and deposition experiments on peat soils have not been performed. If peat soils are susceptible to surface erosion, the effects should be observed in agricultural drainage. However, the Municipal Water Quality Investigations (MWQI) data on drainage from Bouldin Island show suspended sediment levels similar to those of channel water, suggesting that not much suspension of peat soils occurs in agricultural drainage.

Although sediment resuspension has not been observed under existing agricultural conditions, wind mixing could result in sediment resuspension on the reservoir islands under flooded conditions. If it occurred, Delta Wetlands would not discharge until sediment particles settled, as specified in Mitigation Measure C-7, described on page 3C-30 of the 1995 DEIR/EIS (see page 3C-34 of FEIS Volume 1). The WQMP requires that Delta Wetlands monitor TOC, bromide, TDS, chloride, UVA, DO, turbidity, and temperature. The real-time water quality monitoring required by the WQMP should adequately prevent Delta Wetlands from discharging water with excessive levels of nutrients, suspended sediment, or DOC concentrations.

C14-14. See responses to Comments C14-11 and C14-13 above.

C14-15. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, Including the CALFED Bay-Delta Program".

C14-16. Delta Wetlands Project operations would not affect the quantity of SWP and CVP supplies because the project would not be allowed to interfere with SWP and CVP operations. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program", regarding coordination of project operations with the SWP and CVP. Whereas the monthly modeling using the X2 equation might produce the effect described by the commenter in a few *simulated* years, *actual* project operations would be controlled so that no interference with SWP and CVP exports could occur. See response to Comment B7-1. Additionally, as described in Chapter 2 of FEIS Volume 1, Delta Wetlands entered into stipulated agreements with both DWR and USBR during the 1997 water right hearing. These agreements describe how Delta Wetlands would operate independently without interfering with DWR's and USBR's operations of the SWP and CVP. Changes in X2 attributable to the project are further restricted by the terms of the protest dismissal agreement between CCWD and Delta Wetlands; see response to Comment C9-17 and the Appendix to the Response to Comments for more details about the agreement.

C14-17. See response to Comment C9-11.

C14-18. As described in Appendix 2 under "Related Agreements, Programs, and Studies" and in Appendix 4, "Section 404(b)(1) Alternatives Analysis", there are many agreements, programs, and studies related to environmental conditions in the Delta and the quantity and/or quality of water supply in the Delta. Implementation of most of the programs described in these sections remains uncertain. Although particular Delta facilities may be implemented as part of the CALFED program, they were not described in detail in the 1995 DEIR/EIS because the feasibility of implementing those facilities is speculative. The 2000 REIR/EIS included an update on the status of the CALFED program, which calls for the development of in-Delta storage and south-Delta improvements to allow the use of full SWP pumping capacity. See also response to Comment C9-52.

C14-19. Tidal hydrodynamics in channels are fully described in Appendix B1 of the 1995 DEIR/EIS. Changes in channel velocities that would result from Delta Wetlands Project operations were estimated by adding the project's discharge flow to the tidal flow. Figures B1-45 through B1-50 show the effects of maximum possible Delta Wetlands Project operations on channel flows and velocities.

The figures indicate substantial changes in channel flows and corresponding velocities during maximum project discharges. The largest effects are predicted for Old and Middle Rivers between Bacon Island and the SWP and CVP export pumps. However, flow and velocity in these channels are governed by maximum export capacities without regard for the source of water; Delta Wetlands Project operations therefore would not

change the maximum flows and velocities in these channels, although they would increase the frequency of these maximum channel flows and velocities. This effect was determined to be less than significant.

Hydrodynamic conditions were not simulated for cumulative future conditions. Cumulative future conditions that include channel improvements under DWR's South Delta Project would allow higher maximum export rates; therefore, the maximum channel velocities under future conditions would be higher than those reported for the existing condition. However, these future hydrodynamic conditions cannot be simulated because changes in channel configurations, modifications to Clifton Court Forebay operations, and the design for new intakes (including new fish screens) proposed as part of the South Delta Project are not yet finalized. Nevertheless, it can be assumed that the effect of the Delta Wetlands Project on future cumulative hydrodynamic conditions would be similar to the effect described for the existing condition; Delta Wetlands Project operations would increase the *frequency* of these maximum channel flows but would not increase the maximum flows and velocities in these south-Delta channels. The 1995 DEIR/EIS fisheries assessment assumed operation of the barrier at the head of Old River; see also response to Comment B6-28.

C14-20. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents an analysis of levee stability for the Delta Wetlands Project's proposed reservoir island levees. The analysis includes an evaluation of slope stability under rapid drawdown and seismic conditions, as well as postconstruction and long-term conditions.

C14-21. See Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow".

C14-22. The project as analyzed in the 2000 REIR/EIS included the terms of the federal and state biological opinions and described how these terms, particularly the FOC, limit project operations to protect aquatic resources. All measures included in the biological opinions would be made terms of any USACE permit issued to Delta Wetlands in accordance with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

C14-23. The commenter is correct in noting that Delta Wetlands discharges would not have the same biological benefits as Delta inflows. See response to Comment A4-3.

C14-24. The commenter's suggested change to the text on page 3A-9 of the 1995 DEIR/EIS does not convey the intended meaning; the change has not been made.

The text referred to by the commenter on page 3A-15 of the 1995 DEIR/EIS should have read as follows:

> "Delta Wetlands discharge for export would occur during months when SWP and CVP export pumping is limited by the 1995 WQCP 'percent inflow' export limits".

The correction to the title of Table 3A-4 has been noted; the values shown in the table do not represent cumulative no-project conditions.

C14-25. The correction to the description of DWRSIM has been noted. This correction does not affect understanding of the impact assessment; therefore, the text has not been changed.

C14-26. The commenter is correct in noting that Figure A1-1 identifies streams that are not included in DWRSIM. This correction does not affect understanding of the impact assessment; therefore, no change has been made to the text.

C14-27. The correct minimum export pumping value of 1,500 cfs (from the 1995 WQCP) was used in the DeltaSOS simulations described in the 1995 DEIR/EIS.

C14-28. The commenter's correction has been noted. These simulation results have been replaced with those included in the 2000 REIR/EIS for the analysis of the proposed project. This correction does not change the impact analysis; therefore, no change has been made to the text.

C14-29. The commenter's correction has been noted. These simulation results have been replaced with those included in the 2000 REIR/EIS for the analysis of the proposed project. This correction does not change the impact analysis; therefore, no change has been made to the text.

C14-30. The commenter is correct in noting that the annual totals in Table A3-4a are incorrect. The correct values are shown in Table A3-1, in the column labeled "Banks & Tracy Pumping".

C14-31. The potential response of species to flow conditions was considered in the evaluation of project impacts on fish. The DeltaMOVE model was used to assess the movement of water in the Delta and the potential effect on fish movement and entrainment. This information, together with species-specific information about timing and distribution of fish occurrence, was used to estimate effects on fish populations and homing cues; see Chapter 3F and Appendix F2 of the 1995 DEIR/EIS. This issue was also discussed in the analysis of project effects on Mokelumne River salmon presented in Chapter 5 of the 2000 REIR/EIS.

As described in the 1995 DEIR/EIS and the 2000 REIR/EIS, Delta Wetlands Project operations would not affect compliance with the minimum-outflow objectives in the 1995 WQCP, and they would not affect inflow from the San Joaquin, Sacramento, or Mokelumne Rivers. See also responses to Comments A2-2 and A4-3 regarding the relationship of project diversions and discharges to the 1995 WQCP E/I ratio.

C14-32. The 1995 DEIR/EIS used the best available information and tools in the evaluation of impacts. The limitations of the methodology for assessment of impacts on juvenile chinook salmon were discussed at length with USFWS, NMFS, and DFG (meeting at Jones & Stokes Associates' office in Sacramento, September 5, 1995). Alternative methodologies were not identified. To recognize that modeling results may not encompass

the full range of impacts, the agencies acknowledged a margin of error in the modeling during the ESA consultation process and ensured that the fish protection measures in the FOC and RPMs can be used to address a wide range of potential effect. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for information on protective measures for juvenile chinook salmon included in the FOC and RPMs. See also responses to Comments A2-4 and A2-5 from NMFS regarding the mortality index used in the 1995 DEIR/EIS fisheries impact assessment.

C14-33. See responses to Comments B7-74 and B7-83 regarding the abundance and distribution of splittail and analysis of Delta Wetlands Project effects on splittail.

C14-34. The analysis of Delta Wetlands Project impacts on the transport of striped bass and delta smelt was conservative (i.e., it probably overestimated impacts) because it was recognized that larval and juvenile fish demonstrate volitional behavior. Insufficient information is available to develop relationships between volitional behavior and changes in flow and other habitat conditions. The FOC and RPMs included in the biological opinions would be used to address a wide range of potential impacts of the Delta Wetlands Project. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

C14-35. See response to Comment B6-60 regarding fish screen design, and response to Comment B7-64 regarding predation at Delta Wetlands intake facilities.

C14-36. Impact F-5 in the 1995 DEIR/EIS identifies an increase in entrainment loss of striped bass eggs and larvae, delta smelt larvae, and longfin smelt larvae as a significant impact. In addition, Impact F-7 identifies an increase in entrainment loss of juvenile striped bass and delta smelt as a significant impact. Implementing the FOC and RPMs will eliminate most of the potential for entrainment of fish eggs and larvae. Using effective fish screens that meet the criteria specified in the FOC also would prevent entrainment of juvenile and adult fish. Although some fish may still be entrained in diversions, incorporating the FOC and RPMs into the proposed project mitigates entrainment impacts to a less-than-significant level. For details, see "Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows, Downstream Transport, Area of Optimal Salinity Habitat, and Entrainment" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions". A plan for salvage of fish that rear on the project islands was not developed. If reservoir islands are determined to provide rearing habitat conducive to survival of fish (e.g., delta smelt), Delta Wetlands could work with USFWS to develop a management and salvage program.

C14-37. See response to Comment C2-5. See also response to comment B6-35 regarding the difference between water budget terms under the No-Project Alternative and existing conditions.

C14-38. The information presented in this attachment was considered in the responses to comments presented above.

Letter C15

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IRONHOUSE SANITARY DISTRICT
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December 21, 1995

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1324 J Street, Room 1444
Sacramento, CA 95814-2922

RE: Comments on Delta Wetlands Draft EIR/S

Gentlemen:

Thank you for the opportunity to comment on the Delta Wetlands Draft Environmental Impact Report/Statement. Ironhouse Sanitary District (the "District") provides sanitary sewage service to the Oakley and Bethel Island communities and surrounding areas located in eastern Contra Costa County, California. The District has the following comments on the Draft EIR/S, each of which is numbered to assist you in responding to them. Please feel free to contact me directly if you have any questions concerning any of my comments.

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COMMENT 1. Please include a reference to the District's Expansion Plan as it relates to Jersey Island in the Final EIR/S.

The District owns approximately 2,800 acres on Jersey Island. The District purchased these lands in order to implement its long-range Wastewater Facilities Upgrade and Expansion Plan, which is described in detail in the Final Environmental Impact Report: IRONHOUSE SANITARY DISTRICT WASTEWATER FACILITIES PLAN & DELTA ENVIRONMENT SCIENCE CENTER, certified by the District on November 1, 1994. A copy of this FEIR is attached for your reference. As described in the FEIR, the District intends to use its lands on Jersey Island for the land application of recycled water on irrigated pasture and agricultural crops, and for the application of biosolids at agronomic rates as a fertilizer and soil amendment, all in support of the District's agricultural activities on Jersey Island. This reference would appear to fit in Appendix 2 in the section entitled "Related Agreements, Programs and Studies." C15-1

COMMENT 2. What will be the impact of the flooding of Webb Tract on the height of the water table on Jersey Island and the District's plan to use the Island for the land application of recycled water and biosolids as part of its agricultural operations? C15-2

The Draft EIR/S indirectly discusses this issue under "Project Features to Control Seepage," at pages 3D-8 through 3D-10, and describes "Seepage Performance Standards" at page 3D-9. The DEIR/S at page 3D-9 also states that "Final seepage performance standards will be set by SWRCB in consultation with the local reclamation districts governing adjacent islands, the technical review group described below, and DWR." The DEIR/S identifies "Impact D-2: Potential for Seepage from Reservoir Islands to Adjacent Islands" at page 3D-15. Figure 3D-3, among other features, shows background piezometer locations. No background piezometers are shown on Jersey Island.

The District requests that the Final EIR/S, in answering the above question, specifically comment on at least the following items:

(a) The Draft EIR/S discusses the impacts of the flooding of the DW islands on the heights of the water tables on adjacent islands, including Jersey Island, in the most general of terms. See, for example, Impact D-2 at page 3D-15, which states "Implementation of Alternative 1 could increase the potential for seepage beneath the DW island levees to adjacent islands during project operation." In order to enable the decision-makers and interested parties to adequately understand the seepage impacts of the Project, the Draft EIR/S needs to provide a much more detailed discussion of these impacts. The State CEQA Guidelines at Section 15146(a) provide: "An EIR on a construction project will necessarily be more detailed in the specific effects of the project than will be an EIR on the adoption of a local general plan or comprehensive zoning ordinance because the effects of the construction can be predicted with greater accuracy." Since the DW Project is a "construction project," the DRAFT EIR/S must specifically analyze, among other effects, whether the flooding of Webb Tract will increase the height of the water table on Jersey Island. If this flooding will impact the height of the water table, this analysis should be quantitative and show how the height of the water table on Jersey Island will change during the course of a year as water is diverted onto and discharged from Webb Tract. C15-3

(b) The Draft EIR/S at page 3D-3 notes that "Site-specific information on groundwater conditions on the DW islands and neighboring islands is now being collected by HLA and Hultgren Geotechnical Engineers under contract to give an indication of existing seepage through the aquifer." The DRAFT EIR/S also references Appendix D1 for groundwater monitoring to date. Please provide a detailed list, including page references, of all existing and new data pertaining to groundwater conditions on Jersey Island. C15-4

(c) Would the seepage performance standards recommended by Harding Lawson Associates and approved by the Seepage Review Committee, along with the remedial measures to control seepage C15-5

discussed at page 3D-10, ensure that the District may use Jersey Island for its intended purposes? Please refer to the attached copy of the FEIR, which describes these purposes at Section 2.4.2 beginning at page 2-14, in order to make your response specific to Jersey Island. C15-5 cont'd

(d) What would be the District's remedy if the remedial measures to control seepage discussed at page 3D-10 of the Draft EIR/S fail and the height of the water table on Jersey Island, or any other adjacent island, increases? Would the DW Project pump out any excess water on Jersey Island to lower the water table to its preexisting level? Would the DW Project make alternate provision for the District to dispose of its recycled water and biosolids if this could not be done on Jersey Island due to an increase in the height of the water table? Would the DW reimburse Reclamation District 830 for any increases in pumping costs it may experience due to the flooding of Webb Tract, including increased electricity costs and any upgrading of its existing pumps? (Note: Reclamation District 830 is separately commenting on the Draft EIR/S.) C15-6

(e) What would be the impacts of "relief wells installed at regular spacings near the toes of existing levees on neighboring islands," as described at page 3D-10 of the DEIR/S, on the stability of these levees? Please explain why these relief wells "can reduce the risk of levee instability as subsidence continues," as noted on page 3D-10 of the Draft EIR/S. C15-7

(f) The District requests that it be included in the group which will consult with SWRCB on the Final Seepage Performance Standards. Please respond to this request. C15-8

(g) The District requests that an appropriate number of background piezometers be located on Jersey Island. Please respond to this request. C15-9

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COMMENT 3. What will be the impact of the flooding of Webb and Holland Tracts on the height of the water table on Bethel Island and Hotchkiss Tract, where the District's sewer system piping is subject to significant infiltration?

Figure 3D-3, among other features, shows piezometer locations on Bethel Island (seven) and on Hotchkiss Tract in the vicinity of Sand Mound Slough (one). Would these locations be adequate to monitor the height of the water table in these areas? The concern here is that an increase in the height of the water table will increase infiltration loads on the sewer collection system, resulting in an increase in pumping, treatment and disposal costs. Please contact me directly for information on the location of the sewer collection system pipes which are experiencing infiltration. C15-10

A related potential problem concerns an existing, unused District collection pipeline which runs under Sand Mound Slough between Holland and Hotchkiss Tracts. Would the flooding of Holland Tract allow water to enter this pipe and be transported through it to Hotchkiss Tract. Please contact me directly at the number listed above for information on this unused pipeline. C15-11

COMMENT 4. The Draft EIR/S notes at page 3E-11 that boaters docked at the DW Project facilities will use pumpout stations open to the public located on Bethel Island and other Delta Islands. No such stations exist on Bethel Island.

There are no boating-related sewage treatment and pumpout facilities "open to the public" located on Bethel Island. (Bethel Island is served by the District.) Existing marina operators pay a user fee to the District based on these operators providing pump-out services only to their tenants. In order to avoid creating a situation in which it would be difficult, if not impossible, for the District to regulate and collect a fee for this service if it were provided to non-tenant boaters, the Project should work with the District, and any other interested wastewater treatment providers, to develop pumpout stations which are open to public and easy for the District to regulate and ensure it is C15-12

receiving a fee for pumpout services provided to boaters docked at the DW Project facilities. C15-12 cont'd

COMMENT 5. Would the Delta Environment Science Center (DESC) be eligible to receive funding from the DW Environmental Research Fund?

The DEIR/S at page 2-9 describes the DW Environmental Research Fund, which would contribute $2 per acre-foot of water sold for Delta export to a research fund established to sponsor research work. The attached FEIR at Section 2.5, beginning at page 2-18, describes the Delta Environment Science Center ("DESC"), which will be developed on District land provided to a coalition of local governments, educational institutions and environmental organizations. It seems that the research activities which are planned for the DESC would be eligible for funding from this Research Fund. Is this correct? If so, what would be the likely level of annual funding made available by the Research Fund, and what percentage of this annual funding could be made available to the DESC? C15-13

In closing, thank you for the opportunity to comment on the Draft EIR/S. I am looking forward to your responses to the District's comments.

Very truly yours,

for David N. Bauer,
District Manager

Encl: FEIR: IRONHOUSE SANITARY DISTRICT WASTEWATER FACILITIES PLAN & DELTA ENVIRONMENT SCIENCE CENTER, October. 1994.

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FINAL ENVIRONMENTAL IMPACT REPORT

IRONHOUSE SANITARY DISTRICT WASTEWATER FACILITIES PLAN & DELTA ENVIRONMENT SCIENCE CENTER

1. Final Environmental Impact Report Text
2. Comments and Responses

October, 1994

SCH# 92093042
(Previously SCH# 91093013)

IRONHOUSE SANITARY DISTRICT

Ironhouse Sanitary District

C15-1. This information on future uses of land on Jersey Island has been noted. Discharges of the Ironhouse Sanitary District wastewater facilities into the San Joaquin River would be required to comply with all applicable water quality standards, and the district uses would not affect overall water supply in the Delta. Because Ironhouse Sanitary District's uses would not affect the quality or quantity of Delta water supply, the district's Wastewater Facilities Upgrade and Expansion Plan has not been included in the discussion in Appendix 2 of programs and studies that influence the cumulative environment in the Delta.

C15-2. The Delta Wetlands Project would be required to control groundwater in the vicinity of the project islands to ensure that seepage from the Delta Wetlands reservoir islands would not result in a significant impact. Refer to Chapter 6 and Appendix H of the 2000 REIR/EIS for a quantitative analysis of the potential seepage effects of the Delta Wetlands Project. Because the project's potential seepage would be controlled, the groundwater levels southwest of Webb Tract would not change substantially. Additionally, any minor change in groundwater levels attributable to the project would likely be negligible on Jersey Island because Little Franks Tract, which is between Jersey Island and Webb Tract, is already submerged and is recharging the aquifer. With the interceptor well system in place on Webb Tract as proposed, the Delta Wetlands Project would not affect Jersey Island groundwater levels or the sanitary district's ability to use Jersey Island as proposed.

C15-3. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents an analysis of the potential seepage impacts of Delta Wetlands reservoir operations and an evaluation of the effectiveness of the proposed seepage performance standards.

C15-4. No groundwater data have been collected on Jersey Island to date. Jersey Island was not included in the earlier seepage monitoring plans because, as described above, it is reasonably remote from Webb Tract with respect to seepage risk. Also, both Bradford Island and Bethel Island have broad levee reaches much closer to the southwest corner of Webb Tract, and if water were seeping southwest from Webb Tract toward Jersey Island, monitoring on Bradford and Bethel Islands would readily detect it.

C15-5. See response to Comment C15-2 above.

C15-6. Because the project would not have a significant effect on groundwater on Jersey Island, no mitigation or remedial measures are required to be included as part of the environmental document. See response to comment C15-2.

Delta Wetlands and EBMUD submitted a protest dismissal agreement to the SWRCB during the water right hearing. The agreement outlines a dispute resolution process that neighboring landowners could use to identify and remedy levee, seepage, and related problems that may be attributable to the Delta Wetlands Project. The SWRCB included

some of the terms of the protest dismissal agreement in the terms and conditions of Delta Wetlands' water right permit.

C15-7. The installation of relief wells would not adversely affect the stability of neighboring island levees. Relief wells are a common solution for controlling seepage at toes of dams and levees. USACE and reclamation district engineers have used relief wells to control seepage at the toe of levees in the Delta, along the Feather River, and in the Mississippi River basin. The use of relief wells and pumped well systems are described further in the following publications:

Cedergren, H. Seepage, drainage, and flow nets. John Wiley & Sons. New York. 1967. Pp. 242-247, 259-261, and 266-276.

Joint Departments of the Army, Air Force, and the Navy, USA, technical manual TM 5-818-5/AFM 88-5, Chapter 6/NAVFAC P-418, "Dewatering and Groundwater Control".

U.S. Department of the Army. 1978. Design and construction of levees. Engineer manual EM 1110-2-1913. Chapter 5, pp. 6-11; Appendix D—Relief well installation.

_____. 1992. Design, construction, and maintenance of relief wells. Engineering Manual EM 1110-2-1914.

Relief wells can help reduce levee instability as subsidence continues because the wells could be operated to control groundwater levels beneath portions of the islands and the adjacent levees. As the interior of the island subsides, the head differential between the adjacent channel and the island interior would increase, resulting in greater pressure that could cause water to seep beneath or through the levees regardless of Delta Wetlands Project operations. Therefore, adjacent landowners could operate the relief wells on their islands to reduce seepage from adjacent channels as the island interiors subside.

It should be noted that the use of relief wells is not part of the proposed project as described in the 1995 DEIR/EIS and 2000 REIR/EIS, but is a potential alternative to using an interceptor well system to control seepage. However, installation of relief wells would require easements or access from neighboring island landowners.

C15-8. Geotechnical engineers would make up the technical advisory committee that provides input on the seepage performance standards. A geotechnical engineer representing the Ironhouse Sanitation District would be eligible to participate on the advisory committee.

The protest dismissal agreement entered into by Delta Wetlands and EBMUD proposes more details about the structure and duties of a technical review committee, identified in the agreement as the "Reservoir Island Monitoring and Action Board". As described above, the SWRCB included some of the terms of the protest dismissal agreement in the terms and conditions of the Delta Wetlands water right permit.

C15-9. See response to Comment C15-4 above.

C15-10. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents an analysis of the potential seepage impacts of Delta Wetlands reservoir operations and an evaluation of the effectiveness of the proposed seepage performance standards. Based on this analysis, a new mitigation measure is recommended to improve the proposed seepage control system and reduce potential impacts of the project to a less-than-significant level. See Chapter 6 of the 2000 REIR/EIS. As on Jersey Island, seepage from Webb Tract to Bethel Island would likely be negligible; Franks Tract and Little Franks Tract, which are between Bethel Island and Webb Tract, are already submerged and are recharging the aquifer. Because Hotchkiss Tract is relatively far from the proposed reservoir islands (see Figure 3D-3), water storage on Webb Tract is expected to have no effect on groundwater levels at Hotchkiss Tract. The piezometers on Hotchkiss Tract would be used to establish background head levels as described in Chapter 3D of the 1995 DEIR/EIS.

C15-11. The proposed Delta Wetlands Project would not flood Holland Tract (refer to the description of Alternatives 1 and 2 in Chapter 2 of the 1995 DEIR/EIS). The collection pipeline is outside the HMP area, so it would not be affected by activities associated with the proposed project. The 1995 DEIR/EIS also analyzes the environmental effects of a four-reservoir-island alternative (refer to the description of Alternative 3 in Chapter 2 of the 1995 DEIR/EIS). The commenter has not provided enough detail to determine whether flooding Holland Tract would adversely affect its unused collection pipeline. However, it is highly unlikely that the lead agencies would permit Alternative 3. See also the "Project Alternatives" section in Chapter 2 of the 2000 REIR/EIS.

C15-12. As shown in Figure 3E-4 in Chapter 3E, "Utilities and Highways", of the 1995 DEIR/EIS, pumpout facilities are available in the vicinity of all four project islands and in other areas of the Delta. Boaters using Delta Wetlands Project facilities would use only those pumpout facilities open to the public. The sentence on page 3E-11 that refers to Bethel Island facilities (see page 3E-12 of FEIS Volume 1) has been revised as follows:

> Boaters docked at the Delta Wetlands Project facilities would use pumpout stations open to the public on Andrus Island, Empire Tract, ~~Bethel Island,~~ Terminous Tract, or other pumpout stations in the Delta (Figure 3E-4).

See also Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

C15-13. The amount of funding available through the environmental research fund would vary according to Delta Wetlands' annual water sales. The simulations performed for the 2000 REIR/EIS for Alternative 2, for example, estimated average discharges to export of 114–138 TAF/year; if this amount of water were sold at the price of $200 per acre-foot used in the 1995 DEIR/EIS estimates, an average of $228,000–$276,000 per year would be contributed to research through the environmental research fund. As described on

page 2-9 of the 1995 DEIR/EIS (page 2-11 of FEIS Volume 1), the allocation of those funds would be under the direction of Delta Wetlands and a research committee. The research committee would serve as a "grants committee" that would determine where monies would be spent. It would be made up of representatives from DFG, USFWS, NMFS, the SWRCB, Delta Wetlands, fishery-oriented and waterfowl-oriented organizations, and one general environmental organization.

Letter C16

RECLAMATION DISTRICT NO. 830
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December 21, 1995

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1324 J Street, Room 1444
Sacramento, CA 95814-2922

RE: Comments on Delta Wetlands Draft EIR/S

Gentlemen:

Thank you for the opportunity to comment on the Delta Wetlands Draft Environmental Impact Report/Statement. Reclamation District 830 ("RD 830) is located on Jersey Island. The District has the following comments on the Draft EIR/S, each of which is numbered to assist you in responding to them. Please feel free to contact me directly if you have any questions concerning any of my comments.

<u>COMMENT 1. How will the Project mitigate the impacts on Jersey Island Road of the additional automobile traffic which will be generated by the development of recreational facilities along the perimeter levees on Webb Tract? Jersey Island Road is the exclusive means of vehicular access from</u> C16-1

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the mainland to Webb Tract via the Delta Ferry Authority. This road runs from East Cypress Road to the ferry slip, a distance of six miles.

The DEIR/S at page 2-9 states that "DW proposes to construct a maximum of 11 recreation facilities on each of these [four] islands along the perimeter levees .... Each recreation facility ... would include living quarters with a maximum of 40 bedrooms, a 30-berth floating dock ..., a 36 berth floating dock on the interior of the island ..., and a 40-car parking lot located along the levee crest access road." For each DW island, including Webb Tract, this equates to a potential maximum of 440 bedrooms, 726 berths at floating docks and parking for 440 cars.

Jersey Island Road provides the exclusive vehicular access from the mainland to Webb Tract. It is reasonable to expect that the present level of vehicular use of Jersey Island Road will increase substantially due the above increases in recreation facilities on Webb Tract. This increase will more than offset any reduction in ferry traffic caused by the cessation of farming operations on Webb Tract (Draft EIR/S at page 3E-7), resulting in a substantial net increase. This impact will be a substantial, adverse impact of the DW Project. C16-1 cont'd

The Final EIR/S should analyze these traffic impacts in terms of an appropriate traffic impact measure, such as average daily traffic level, and how these traffic impacts will affect the existing condition of Jersey Island Road, traffic safety along the road and other pertinent factors. This traffic impact analysis should propose appropriate mitigation measures, including the capital improvements required to bring existing Jersey Island Road up to the standard required to serve this increased traffic level, as well as measures to provide for long-term maintenance.

Also note that Contra Costa County has installed a locked gate on Jersey Island Road at approximately three miles south of the ferry slip in order to close the road to all but local traffic. The Draft EIR/S should address whether Jersey Island Road will remain open to Webb Tract recreational traffic and the means by which this traffic will obtain a key to open the gate.

All mitigation measures should include provision for their funding by the DW Project. C16-1 cont'd

COMMENT 2. How will the Project mitigate the impacts of increased vehicular traffic on the approximately three miles of Jersey Island levee with the Jersey Island Road on its crown?

Please see COMMENT 1. Approximately three miles of the Jersey Island Road are located on the crest of the Jersey Island levee. Like most Delta levees, this one is subsiding gradually over time, and accordingly needs periodic raising and strengthening. (In its present condition, the levee does not meet any of the standards for a levee for agricultural purposes, whether the standards are those of FEMA, Corps of Engineers (PL 99), or DWR; the road's surface is at an elevation of two feet below the 100 year flood. Each time the levee is raised, the paved portion of Jersey Island Road along the levee's crown is covered, and must be rebuilt at significant expense. Also, the increased traffic along Jersey Island Road will potentially contribute to the instability of the levee and increase its maintenance costs. The Final EIR/S should analyze how these increased traffic impacts will affect the existing condition of this portion of the Jersey Island levee and propose appropriate mitigation measures. The Final EIR/S should also consider several alternatives, including (1) relocating the ferry serving Webb Tract from the end of Jersey Island Road to a different location (possibly to Bethel Island, Sherman Island or near the Antioch Bridge); and (2) significant additional strengthening, raising and widening of the three miles of Jersey Island levee with the road, to prolong the levee's life and thereby lengthen the period before the levee will need to be raised and the road rebuilt. C16-2

All mitigation measures should include a provision for their funding by the DW Project.

COMMENT 3. How will the Project mitigate the impacts on the Jersey Island levees of the increased wave action from the increased recreational boating activity around Jersey Island resulting from the development of substantial C16-3

new recreational boating facilities along the perimeter levees of all four DW project islands?

The DEIR/S, at page 3J-14, estimates that the DW Project "would result in a net increase of 100,620 annual boater use-days at project build out. This increase represents a 5% increase over existing boater-use days in the Delta." This 5% increase is the average for the entire Delta. Will be the estimated increase in boating activity around Jersey Island be greater than 5%? Increased recreational boating activity around Jersey Island will adversely impact the Island's levees through increased wave action. What will be the impact of this increased wave action on the stability of the Jersey Island levees, and how does the Project propose to mitigate any impacts? C16-3 cont'd

COMMENT 4. The DEIR/S at page 3A-11 states that "DW project operations would not be permitted to interfere with senior appropriative water right holders or Delta riparian users." As the holder of a senior appropriative right, RD 830 supports this policy.

In closing, thank you for the opportunity to comment on the Draft EIR/S. I am looking forward to your responses to RD 830's comments.

Very truly yours,

for David N. Bauer, President
Board of Trustees

Encl: FEIR: IRONHOUSE SANITARY DISTRICT WASTEWATER FACILITIES PLAN & DELTA ENVIRONMENT SCIENCE CENTER, October. 1994.

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Reclamation District No. 830

C16-1. Based on estimated recreation use-days under Alternative 1 (see Chapter 3J), the daily average number of people using the ferry is expected to increase. As indicated in Chapter 3L, "Traffic and Navigation", recreational vehicle trips are expected to increase traffic on Delta roadways during project operations. The commenter is correct in noting that implementing the Delta Wetlands Project would increase traffic on Jersey Island Road compared to existing conditions. The increase in traffic on Delta roadways during project operation is identified as a significant and unavoidable impact (see Impact L-2 on page 3L-10 of FEIS Volume 1).

An analysis of traffic volumes on Jersey Island Road under the proposed Delta Wetlands Project has been conducted. Based on that analysis, LOS would be reduced from A to B on Jersey Island Road north of Dutch Slough Road. The following sentence has been added to the second paragraph under "Operation Impacts" (see page 3L-6 of FEIS Volume 1) which describes the impact assessment methodology used to evaluate project effects on roadway traffic:

> For Jersey Island Road, LOS was calculated using an assumed capacity of 500 cars per hour to determine the V/C ratio.

The discussion of changes in LOS under "Impact L-2: Increase in Traffic on Delta Roadways during Project Operation", has been revised as follows (see page 3L-11 of FEIS Volume 1):

> Additionally, LOS would be reduced by a letter grade, from E to F, on SR 4 south of Cypress Road; and from A to B, on Jersey Island Road north of Dutch Slough Road.

Results of the Jersey Island Road traffic analysis are shown in revised Tables 3L-2, 3L-6, 3L-7, and 3L-8, which follow this response. These tables are included in Chapter 3L of FEIS Volume 1.

It should be noted that the results of the Jersey Island Road traffic analysis described here are based on the predicted traffic calculated for the recreational facilities as proposed in 1995. Since then, the lead agencies and Delta Wetlands have proposed mitigation to reduce the use of the facilities and reduce the corresponding amount of traffic. Additionally, Delta Wetlands has removed construction of the recreation facilities from its CWA permit applications. These changes are described in Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

The gate on Jersey Island Road prevents all but local traffic from passing through to the ferry terminal. As described in Chapter 3L, the recreational facilities on Webb Tract would not be open for public use. Therefore, guests to those facilities would be registered before

Table 3L-2. Existing Traffic Volumes on Roadways in the Project Vicinity

Location	Average Daily Traffic	Peak-Hour Volume
Bacon Island		
Bacon Island Road at the Bacon Island Road bridge	550	55
Lower Jones Road north of Cook Road	300	30
SR 4 east of Tracy Boulevard	5,900	725
Webb Tract		
Jersey Island Road north of Dutch Slough Road	200	20
Cypress Road west of Jersey Island Road	6,917	591
SR 4 south of Cypress Road	11,800	1,400
Bouldin Island		
SR 12 west of Terminous	12,200	1,300
Holland Tract		
Delta Road east of Byron Highway	537	60
SR 4 south of Delta Road	13,000	1,600

Note: These are actual volumes supplied by the sources listed below.

Sources: Caltrans 1988; Chalk, Redic, and Chahal pers. comms.

Table 3L-6. Projected 2010 Traffic Volumes on Roadways near the Delta Wetlands Project Islands with and without the Project

			Future with Project				
	Future without Project		Construction		Operation		
Location	Average Daily Traffic	Peak-Hour Volume	Alternative 1 or 2	Alternative 3	Alternative 1 or 2	Alternative 3	No-Project Alternative
Bacon Island							
Bacon Island Road at the Bacon Island Road bridge	2,336	234	241	241	290	290	257
Lower Jones Road north of Cook Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SR 4 east of Tracy Boulevard	9,000	1,100	1,109	1,114	1,171	1,177	1,127
Webb Tract							
Jersey Island Road north of Dutch Slough Road	200	20	26	26	75	75	39
Cypress Road west of Jersey Island Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SR 4 south of Cypress Road	24,164	2,732	2,741	2,746	2,803	2,809	2,759
Bouldin Island							
SR 12 west of Terminous	24,000	2,900	2,903	2,916	2,949	2,950	2,920
Holland Tract							
Delta Road east of Byron Highway	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SR 4 south of Delta Road	21,013	2,838	2,847	2,852	2,909	2,915	2,865

Notes: N/A = not available.

Operational volumes are equal to without-project volumes plus the estimated number of trips generated by the proposed project under the worst-case assumption that recreation, operations and maintenance, and agricultural traffic would all travel during the same peak hour.

[a] The No-Project Alternative includes increased agricultural and recreational activities compared with existing conditions.

Source: Holland Tract and Webb Tract future without-project volumes from Johnson pers. comm.; Bacon and Bouldin Island future without-project volumes from Reed and Chalk pers. comms.

Table 3L-7. Projected Volume-to-Capacity Ratios and Levels of Service on Roadways near the Delta Wetlands Project Islands, with Existing Roadway Configuration, with and without the Project

		Future with Project				
		Construction		Operation		
Location	Future without Project	Alternative 1 or 2	Alternative 3	Alternative 1 or 2	Alternative 3	No-Project Alternative
Bacon Island						
Bacon Island Road at the Bacon Island Road bridge	0.08 (A)	0.09 (A)	0.09 (A)	0.10 (A)	0.10 (A)	0.09 (A)
Lower Jones Road north of Cook Road	N/A	N/A	N/A	N/A	N/A	N/A
SR 4 east of Tracy Boulevard	0.56 (D)	0.57 (D)	0.57 (D)	0.60 (D)	0.60 (D)	0.57 (D)
Webb Tract						
Jersey Island Road north of Dutch Slough	0.04(A)	0.05(A)	0.05(A)	0.15(B)	0.15(B)	0.08(A)
Cypress Road west of Jersey Island Road	N/A	N/A	N/A	N/A	N/A	N/A
SR 4 south of Cypress Road	0.98 (E)	0.98 (E)	0.98 (E)	1.00 (F)	1.00 (F)	0.99 (E)
Bouldin Island						
SR 12 west of Terminous	1.29 (F)	1.29 (F)	1.30 (F)	1.31 (F)	1.31 (F)	1.30 (F)
Holland Tract						
Delta Road east of Byron Highway	N/A	N/A	N/A	N/A	N/A	N/A
SR 4 south of Delta Road	1.01 (F)	1.02 (F)	1.02 (F)	1.04 (F)	1.04 (F)	1.02 (F)

Notes: N/A = not available.

Numbers in table represent volume-to-capacity ratio. Letters in parentheses represent the corresponding level of service.

These estimates are based on the future traffic volumes with and without the proposed project shown in Table 3L-5 using the existing road facilities.

Source: Information on SR 4 east of Tracy Boulevard and SR 12 from Chalk pers. comm. Information on other segments estimated based on Tables 3L-5 and 3L-3.

Table 3L-8. Projected Volume-to-Capacity Ratios and Levels of Service on Roadways near the Delta Wetlands Project Islands, with Improved Roadway Configuration, with and without the Project

		Future with Project				
		Construction		Operation		
Location	Future without Project	Alternative 1 or 2	Alternative 3	Alternative 1 or 2	Alternative 3	No-Project Alternative
Bacon Island						
Bacon Island Road at the Bacon Island Road bridge	0.08 (A)	0.09 (A)	0.09 (A)	0.10 (A)	0.10 (A)	0.09 (A)
Lower Jones Road north of Cook Road	N/A	N/A	N/A	N/A	N/A	N/A
SR 4 east of Tracy Boulevard	0.54 (C/D)	0.54 (C/D)	0.55 (C/D)	0.57 (C/D)	0.58 (C/D)	0.55 (C/D)
Webb Tract						
Jersey Island Road north of Dutch Slough Road	0.04(A)	0.05(A)	0.05(A)	0.15(B)	0.15(B)	0.08(A)
Cypress Road west of Jersey Island Road	N/A	N/A	N/A	N/A	N/A	N/A
SR 4 south of Cypress Road	0.49 (D)	0.49 (D)	0.49 (D)	0.50 (D)	0.50 (D)	0.50 (D)
Bouldin Island						
SR 12 west of Terminous	0.48 (B)	0.48 (B)	0.49 (B)	0.49 (B)	0.49 (B)	0.49 (B)
Holland Tract						
Delta Road east of Byron Highway	N/A	N/A	N/A	N/A	N/A	N/A
SR 4 south of Delta Road	0.51 (D)	0.51 (D)	0.51 (D)	0.52 (D)	0.52 (D)	0.51 (D)

Notes: N/A = not available.

Numbers in table represent volume-to-capacity ratio. Letters in parentheses represent the corresponding level of service.

These estimates are based on the future traffic volumes with and without the proposed project shown in Table 3L-5 using the improved roadway configuration.

Improvement to four lanes on SR 12 west of Terminous, SR 4 south of Delta Road, and SR 4 south of Cypress Road are Caltrans concepts but are not currently programmed or funded.

Full widening has not been planned for SR 4 east of Tracy Boulevard; however, Caltrans has proposed constructing passing lanes at selected locations and new bridges at Old and Middle Rivers (west of Tracy Boulevard).

Source: Information on SR 4 east of Tracy Boulevard and SR 12 from Chalk pers. comm. Information on other segments estimated based on Tables 3L-5 and 3L-3.

their arrival and the recreation facility operators would arrange access through the gate for those guests.

C16-2. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

C16-3. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

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December 21, 1995

HAND DELIVERED

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
901 P Street
Sacramento, California 95814

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1325 J Street, Room 1444
Sacramento, California 95814-2922

Re: Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project

Gentlemen:

These comments are submitted on behalf of the following protesting parties: Central Delta Water Agency, Reclamation District No. 38, M & T Inc., Reclamation District No. 2027, CCRC Farms, Reclamation District No. 2036, Douglas Morris, Inc., Reclamation District No. 2038 and Reclamation District No. 2072.

Attached hereto and incorporated herein by this reference please find copies of our September 29, 1993, letter to the State Water Resources Control Board and the attachment to our 1988 protests which outline our general concerns.

Our primary concerns continue to be the flood and seepage related threats to surrounding lands and islands.

The Draft EIR/EIS improperly concludes that levee safety on the Delta Wetlands islands will increase and therefore the cumulative flood hazard in the Delta will be reduced. The assumption is made that as subsidence of peat soil continues the factor of safety of existing levees will be reduced. The reclamation districts in the Delta are constantly repairing and rehabilitating their levees to maintain and in most cases increase the factor of safety of the levees. Typically, the landside slopes are flattened or buttressed with landside berms. Incorporated into the "SB-34" State Levee Subvention Program is a mechanism for establishing 400 foot wide easements to control subsidence in peat areas adjacent to levees. There is also a C17-1

trend toward wetland development which could significantly reduce subsidence in peat areas. The conclusion that without project conditions will result in a substantially degrading factor of safety is unsupportable. C17-1 cont'd

The factors of safety of the levees on the Delta Wetlands reservoir and habitat islands have already been improved. The additional improvement contemplated by the project will in our view be offset by the detriment associated with filling the reservoir islands with water. Once the land surface is covered with water, the subsidence benefit is achieved. The reservoir component of the project simply adds detriment without corresponding benefit. Although the damage to the Delta Wetlands reservoir island improved levees from a flood event could be reduced, the seepage impact and potential windwave impacts to adjoining island levees create an increased risk. With the proposed Delta Wetlands reservoir island water level of +6, the chance of wind-generated waves overtopping the Delta Wetlands island levees is real. The draft talks about hardening the levee crown but does not adequately analyze how they will be hardened or the impacts to adjoining islands or to the Delta Wetlands island levees and roadways thereon. Wind-generated waves could result in a wave water height or run up in the magnitude of 6 or 7 feet. The Delta Wetlands island levees could be eroded such that the wind-generated wave could impact adjoining islands. If a Delta Wetlands Reservoir was already full at the time of the flood event, the risk to adjoining islands would be substantially increased over the no project alternative. Under a no project condition, the levee would fail during the flood event then the island would fill during 24 hour period thereafter to an elevation less than the +6 feet proposed reservoir level thereby presenting a reduced threat from wind-generated waves. C17-2

The draft assumes that the seepage mitigation plan of installation of interceptor wells will eliminate the seepage impact on adjoining lands and islands. Although such interceptor wells appear to have the potential for intercepting the seepage, the effectiveness of such a plan on the large scale required for the proposed project has not been demonstrated. The draft fails to analyze the costs associated with the required mitigation and the funding of the same. The draft at page 3D-10 references other technically feasible seepage control measures but fails to analyze the costs and impacts of the same. C17-3

The seepage performance standards specified at 3D-9 of the draft would allow for increased seepage into adjoining islands and lands during much of the year. The draft assumes no increased seepage and totally fails to analyze the potential impacts. We have been working with Delta Wetlands to improve the seepage performance standards to minimize the amount of seepage C17-4

tolerated as a part of a fair performance standard. The standard outlined in the draft would allow up to 2.25 feet of increased seepage during much of the year which would be very damaging. The draft should analyze the impacts resulting from a reasonable range of possible seepage increases due to the tolerance within the performance standards. C17-4 cont'd

The draft does not appear to address the possible changes in velocity of the water in the channels adjacent to adjoining island levees due to the filling or discharge from the Delta Wetlands reservoirs. Experience with dewatering flooded islands has shown that in some cases it has been necessary to add wave wash protection on the adjoining island levees directly opposite the discharge pumps. C17-5

The proposed excavation below the ground surface within 400 feet of the levee is ill advised. AT page 3D-11, the draft provides for 2000 feet inward from the final toe of an improved levee where seepage restrictions will be required. Since the seepage areas cannot be adequately identified prior to filling of the reservoir or prior to prolonged operation, the 2000 foot setback should be applied to all borrow sites. C17-6

In our view, the Webb Tract reservoir is likely to significantly adversely affect Bradford Island and Mandeville Island. The Bacon Island reservoir is likely to significantly adversely affect Quimby Island, Mandeville Island, Lower Jones Tract, Upper Jones Tract, Woodward Island, Orwood Tract, Palm Tract, Holland Tract and probably McDonald Tract. C17-7

Because of the significant risk to other islands and the importance of maintaining the levee systems in the Delta, the effectiveness of the mitigation measures for the Delta Wetlands project is of immeasurable importance. To assure that mitigation measures can be carried out, we believe that an adequate security deposit should be required to ensure that corrective action can be taken in the event the Delta Wetlands project proves to be financially unsuccessful and/or is operated in a careless manner.

Another area of concern not addressed in the draft is the possible use of the Delta Wetlands islands for storage and/or disposal of wastewater and biosolids (sewage sludge). The Bay Area Recycled Water program has specifically identified Webb and Bacon Islands as potential wastewater storage sites. The risk of contamination of the Delta waters and the impact on water users throughout the State is a major concern. C17-8

The Central Delta Water Agency has been working with the Delta Wetlands project proponents to resolve an appropriate mitigation agreement. Although there has been progress, a couple

of items of major difference remain. Continued effort to resolve the differences is anticipated.

Yours very truly,

DANTE JOHN NOMELLINI
Attorney for Protestants

DJN:ju
Enclosures
cc: CDWA
RD No. 38
M & T Inc.
RD No. 2027
CCRC Farms
RD No. 2036
Douglas Morris, Inc.
RD No. 2038
RD No. 2072

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September 29, 1993

State Water Resources Control Board
Division of Water Rights
c/o Dave Cornelius
P. O. Box 2000
Sacramento, California 95812-2000

Re: Delta Wetlands
New Applications 30267, 30268, 30269 and 30270
Petitions to Change Applications 29061, 29062, 29063 and 29066

Dear Sir:

On or about January 21, 1988, Reclamation District No. 2072 filed protests to Applications 29061, 29062, 29063 and 19066 based on both injury to vested water rights and environmental, etc. considerations. Please accept this letter as an amendment to such protests and as a protest to such new applications and the petitions to change the old applications.

The proposed increased period of diversion will increase the potential for conflict with existing water right holders. There is generally no water available for appropriation during the period of June through October 15 and to grant a diversion right during this period will surely lead to future conflict. The proposal to discharge from one proposed reservoir for rediversion to another reservoir during this period should also not be allowed as the potential for abuse and conflict is too great. C17-9

The proposals to increase the elevation of storage within the reservoirs and have storage year round greatly increase the threats due to seepage into the levee foundations and farmland on adjoining islands and increase the threat of reservoir island levee failure. The increased head will be a greater driving force on the seepage flows and will increase the forces which could lead to reservoir levee failures in the direction of the surrounding channels during low or minus tides. The increased reservoir elevation will also increase the threat of overtopping due to wind driven waves. In many cases, such overtopping could lead to erosion of the levee section and failure of the levee. C17-10

The opportunity to propagate seed crops for food for wintering waterfowl depends upon the reservoir being dry or very shallow during the growing season. If water is actually stored year round, this opportunity will be eliminated. C17-11

Increases in diversions from the Delta are unjustifiable. Delta water quality standards are clearly inadequate to protect the beneficial uses and public trust values within the Delta and increased diversions will only exacerbate the problem. Additionally, diversions to irrigate lands along the west side of the San Joaquin River watershed will further degrade the already degraded San Joaquin River flows. C17-12

To avoid restatement of our previous protests, we hereby incorporate by reference the allegations contained therein as if fully set forth herein.

Yours very truly,

DANTE JOHN NOMELLINI
Attorney for Reclamation
District No. 2072

DJN:ju
cc: Delta Wetlands
c/o John L. Winther, President
3697 Mt. Diablo Blvd., Suite 120
Lafayette, CA 94549

Trustees of RD 2072

1. Protestant is concerned that seepage from the proposed reservoirs may adversely affect the levee integrity of adjacent islands and destroy the farmability of the lands on adjacent islands.

As has been demonstrated on numerous occasions when delta islands have flooded due to natural causes seepage has occurred along portions of the levee system and in some of the fields on adjacent islands. The degree and extent is difficult to predict, however, correction of the seepage problem is technically difficult and extremely costly. C17-13

2. Once the reservoir is filled the unprotected landside levee slopes will be exposed to erosive forces including wind generated waves. The levee system could then be severely damaged or breached to the extent that the island cannot be reclaimed without a tremendous expense. State and Federal disaster assistance may not be available in which event the island could be lost. Permanent flooding would result in evaporative losses of fresh water which would exceed the losses resulting from farming by at least 2 acre ft. per acre. Additionally the failure of the levees from the inside could result in a domino impact on adjoining islands as wind generated waves over long fetches are allowed to impact the levees of adjacent islands. These same waves could result in destruction of the riparian habitat on the adjacent channel islands and the loss of recreational value associated with the protected meandering channels of the delta. C17-14

The seepage impact which with the proposed reservoir operative would be approximately six months out of the year would with the island permanently flooded then be year around.

3. We are informed that the plan entails building 10 to 1 landside slopes by hydraulicly dredging soil from within the island. Once the soil is taken from the interior of the island to build the landside slopes of the reservoir the land from which the soil is taken will be extremely difficult to reclaim. To the extent organic material is encountered it will be lost. If the project proves unsuccessful what will be the resulting condition of the land? C17-15

4. Is there sufficient surplus flows to allow the applicant to operate as proposed without encroaching on the rights of others? The operations of the federal Central Valley Project and State Water Project as well as the Bay/Delta environment depend heavily on the existence of unregulated flow. It would appear that in dry, critical and perhaps below normal years there is no surplus water to be diverted in March or April. If the project is not economically sound it will fail and only the damage will remain. Additionally, over subscription of limited supplies will tend to result in C17-16

unlawful encroachment on the rights of others and enforcement problems.

5. The applicant seeks a rate of diversion of 3000 cfs. for the Bouldin Island reservoir, 5000 cfs for the Webb Tract reservoir, 3000 cfs for the Holland Reservoir, and 5000 cfs for the Bacon Island reservoir. The combined diversion could be 18,000 cfs. The diversions individually or in combination could induce or aggravate salinity intrusion and could result in water level drawdowns detrimental to other diverters and to the environment including the fisheries. C17-16 cont'd

6. Winter waterfowl habitat would be substantially degraded and probably lost. Delta farmland presently provides winter habitat to hundreds of thousands of migrating waterfowl. The waterfowl feed on the grain left behind after harvest and various naturally occurring seeds. The applicant has requested a diversion period of December 15, to May 1. If the reservoir was presumably emptied by the end of June there would be very little time for a feed crop to be planted and mature. It is doubtful that much of the ground within the reservoir would be dry enough to sustain seed planting and germination. Whether or not aquatic type vegetation can provide comparable or adequate feed is not clear. C17-17

7. The spring nesting habitat for waterfowl and upland game provided on the island will be inundated. The shoreline habitat which might develop along the levee with all the disturbances of boating traffic in the waterway and vehicles traveling on the levee road will be of questionable quality and substantially reduced in acreage.

8. Destruction of the farmland within the island will result in the loss of jobs, the loss of equipment service and sales and the loss of sales of seed, fertilizer and other supplies. The loss of the economy generated by the agricultural activities does not appear to be replaceable by way of reservoir operation. C17-18

9. Flooding of the islands to differing degrees could jeopardize the integrity and safety of the various road and highway systems as well as various utilities. C17-19

10. The intentional flooding of four (4) major delta islands constitutes a major gamble with the water rights, flood control integrity and environment of the Bay/Delta estuarine system. Such a bold step should not be taken. With careful evaluation and satisfactory safeguards perhaps one island could be considered for experimental reservoir operation. In such event an acceptable plan should be prepared for restoration of the island to farming in the event the reservoir operation results in problems with the levees, seepage, environment or water rights of others. C17-20

There should be a bonded commitment by the developer to restore the island to farming within a specified period of time after determination by the SWRCB or some other appropriate body (or arbitrator) that there are unresolved problems with regard to water rights, levees, seepage or the environment. Revocation of a permit of this type after the damage is done is not a satisfactory remedy. Based on the historical costs associated with restoration of flooded islands the bond amount would have to be in the 10 to 20 million dollar range depending upon the island in question and the degree of land destruction resulting from construction of the reservoir levees. The amount of the bond could be subject to review and adjustment on an annual basis so as to reflect demonstrated reductions or increases in the estimated costs of restoration. A bond should also be posted to cover the cost necessary to cut off seepage. The cost of construction of a bentonite curtain or some other appropriate corrective action would be the basis for determining the amount of such a bond. An arbitrator or panel of arbitrators should be chosen in advance of the reservoir filling. The arbitrator(s) would then be asked to ascertain and quantify the pre-reservoir filling seepage. After filling the arbitrator(s) would determine whether or not additional seepage was caused by the filling of the reservoir. If additional seepage was caused by the filling of the reservoir then the applicant would be required to carry out the corrective action. The bond would assure the performance of the corrective work. If the corrective work failed to stop the additional seepage the applicant would be required to restore the island to farming as set forth above. C17-20 cont'd

If an experiment is to be conducted with flooding an entire island perhaps Mildred Island which is already flooded should be considered.

11. The August 1987 Sacramento-San Joaquin Delta Atlas reflects for the period of 1980-1986 the State and Federal funds expended to repair flood damage. Over 21 million dollars was expended on Webb Tract; over 8 million dollars on Holland Tract, over 4 million on Bouldin Island and about $600,000.00 on Bacon Island. These substantial public investments to protect the public interests should not be jeopardized. Cautious and careful action is required.

Central Delta Water Agency et al. (Nomellini, Grilli & McDaniel)

C17-1. Implementing flood control programs such as DWR's Delta water management programs and levee maintenance programs would improve the regional flood control system and reduce flood-related risks to adjacent islands. The beneficial cumulative effects identified in Chapter 3D are the result of implementing these programs in conjunction with the Delta Wetlands Project alternatives.

C17-2. The commenter is referring to information in the 1995 DEIR/EIS that was replaced by the 2000 REIR/EIS. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents an analysis of the potential seepage impacts of Delta Wetlands reservoir operations and an evaluation of the stability of the proposed reservoir levees. The analysis of levee stability evaluates wind and wave run-up on the interior of the islands and the effectiveness of the erosion control methods proposed by Delta Wetlands. See Chapter 3D of Volume 1 of this FEIS and Appendix H of the 2000 REIR/EIS for more information; refer also to response to Comment E8-3.

C17-3. The commenter is referring to information in the 1995 DEIR/EIS that was replaced by the 2000 REIR/EIS. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents an analysis of the potential seepage impacts of Delta Wetlands reservoir operations and an evaluation of the effectiveness of the proposed seepage performance standards. There is no requirement that the NEPA and CEQA documentation analyze the costs associated with operation of the interceptor well system; Delta Wetlands would be responsible for funding all terms and conditions and mitigation measures adopted as part of any permits issued by USACE and the SWRCB.

C17-4. The commenter is concerned that the proposed method for deriving seepage performance standards would not take into account seasonal variations in groundwater levels. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents an analysis of the potential seepage impacts of Delta Wetlands reservoir operations and an evaluation of the effectiveness of the proposed seepage performance standards. The 2000 REIR/EIS impact analysis included the recommendations presented in Appendix H for modifying Delta Wetlands' proposed seepage monitoring program and seepage performance standards as a mitigation measure for potential project impacts.

Additionally, the protest dismissal agreement submitted by Delta Wetlands and EBMUD during the water right hearing proposes a technical review committee, identified in the agreement as the "Reservoir Island Monitoring and Action Board (MAB)". Under the terms of the protest dismissal agreement, the MAB could review and approve changes to the seepage performance standards, including changes or additions to the proposed seepage criteria that could account for the seasonal variation in groundwater levels. The SWRCB included some of the terms of the protest dismissal agreement in the terms and conditions of the Delta Wetlands water right permit.

C17-5. The impact analysis in Chapter 3B, "Hydrodynamics", of the 1995 DEIR/EIS addressed the effects of Delta Wetlands Project operations on local channel velocities and stages. The analysis found that under maximum diversion and discharges, the maximum channel velocities and stages in channels surrounding the project islands would remain within the range of conditions normally encountered during tidal fluctuations. See response to Comment B5-11 regarding scour effects relative to Delta Wetlands discharges into adjacent channels.

C17-6. The commenter is referring to information in the 1995 DEIR/EIS that was replaced by the 2000 REIR/EIS. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents an analysis of the potential seepage impacts of Delta Wetlands reservoir operations, including impacts of borrow sites. See Chapter 3D of Volume 1 of this FEIS and Appendix H of the 2000 REIR/EIS.

C17-7. See response to Comment E8-5.

C17-8. The Delta Wetlands islands are not proposed to be used for the storage and disposal of wastewater and biosolids. Storage of wastewater on Webb Tract and Bacon Island is not compatible with the proposed reservoir island use of the project. Any proposals to dispose wastewater on the Delta Wetlands Project islands would have to be addressed in environmental documents.

C17-9. Delta Wetlands originally applied for water rights to store water seasonally on all four project islands. The Delta Wetlands Project, as originally proposed, was analyzed in a draft EIR/EIS released in December 1990. During the period between December 1990 and the release of the 1995 DEIR/EIS, Delta Wetlands submitted a revised water application (August 1993) and revised its project description to propose using two islands for water storage and two islands to compensate for wetland and wildlife impacts of the operation of those reservoir islands. Many of the remaining comments in this letter pertain to the previous project description and are not applicable to the 1995 DEIR/EIS.

The 1995 DEIR/EIS and the 2000 REIR/EIS evaluated the availability of water for diversion to the Delta Wetlands islands during all months. Additionally, the FOC terms further restrict Delta Wetlands' ability to divert water (see Chapter 2 of FEIS Volume 1 and Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions"). Despite these restrictions, the simulations performed for the 2000 REIR/EIS analysis show that some water is available during the period referred to by the commenter. The proposal to discharge water from one island for rediversion to another island is no longer part of the proposed Delta Wetlands Project. See Chapter 2 of FEIS Volume 1.

C17-10. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents an analysis of the potential seepage impacts of maximum Delta Wetlands reservoir operations and an evaluation of the stability of the proposed reservoir levees. The analysis of levee stability evaluates wind and wave run-up on the interior of the islands and the

effectiveness of the erosion control methods proposed by Delta Wetlands. See Chapter 3D of FEIS Volume 1 and Appendix H of the 2000 REIR/EIS for more information.

C17-11. This comment does not apply to the currently proposed Delta Wetlands Project. The reservoir islands are not designed to propagate seed crops. The habitat management on the two habitat islands would fully compensate for habitat lost on the reservoir islands.

C17-12. The 1995 DEIR/EIS recognizes the delicacy of the Bay-Delta environment and identifies the effects the project would have on biological resources in the Delta (see Chapters 3F, 3G, and 3H). Since this comment letter was written, the SWRCB adopted the 1995 WQCP, which establishes objectives for protecting Delta water quality and beneficial uses. Operation of the Delta Wetlands Project would be consistent with the 1995 WQCP objectives (see Chapter 3A, "Water Supply and Water Project Operations" of FEIS Volume 1. It is not within the scope of the NEPA and CEQA analysis to address the adequacy of the 1995 WQCP and other Delta regulations adopted by USFWS, NMFS, and other federal and state agencies.

C17-13. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents an analysis of the potential seepage impacts of Delta Wetlands reservoir operations.

C17-14. See responses to Comments C10-2 and E8-3.

C17-15. This comment does not apply to the currently proposed Delta Wetlands Project. The Delta Wetlands Project does not include the construction of 10:1 landside slopes (see Chapters 2 and 3D and Appendix 2 in the 1995 DEIR/EIS.) Therefore, the amount of borrow material required for the project is substantially less than proposed in 1990. Furthermore, borrow sites would not constitute a substantial proportion of the surface area of the reservoir islands. If the islands are reclaimed for agricultural use in the future, it may not be possible to farm the borrow pit areas because the organic material would have been displaced; it should be noted, however, that any organic material displaced during borrow activities would remain on the project islands.

C17-16. Delta Wetlands Project operations would be prohibited from interfering with operations conducted by the SWP and CVP and other existing holders of prior water rights. It would also be prohibited from affecting the ability of those who hold prior water rights to comply with Delta water quality standards or protection of biological resources.

C17-17. This comment does not apply to the currently proposed Delta Wetlands Project. Implementing the HMP on habitat islands would compensate for the Delta Wetlands Project's impacts on wildlife. The HMP (Appendix G3) describes in detail compensation for impacts on wintering waterfowl and other species.

C17-18. The analysis presented in Chapter 3K, "Economic Conditions and Effects", concludes that the economic activity generated by the operations and maintenance of project water storage and recreation facilities would offset the reduction in jobs and income caused by the loss of farming on the Delta Wetlands islands. As shown by Table 3K-5, annual direct (i.e., onsite) and secondary (i.e., offsite, regional) employment generated by Alternative 1 would total 415 jobs compared with an estimated 293 jobs under existing (1988) conditions. Similarly, income generated by project operations under Alternative 1 would be higher than income generated by current use of the islands, as shown by Table 3K-6.

Although there would be a net increase in regional economic activity under Alternative 1 (as well as under Alternatives 2 and 3), jobs would shift among industries within Contra Costa and San Joaquin Counties. Project-related job losses would occur primarily in agriculture-dependent industries, such as companies that provide farm equipment services and sales, and sales of fertilizer, seed, and other agriculture supplies and services. Job gains would occur in industries that provide levee maintenance and equipment maintenance services and in recreation-dependent businesses.

C17-19. The effects of flooding the reservoir islands on roads and highways are described in Chapters 3D, "Flood Control", and 3E, "Utilities and Highways".

C17-20. This comment does not apply to the currently proposed Delta Wetlands Project. The Delta Wetlands Project involves diverting and storing water on two islands and creating wetlands and wildlife habitat on two other islands. Refer to the Section 404(b)(1) Alternatives Analysis (Appendix 4 of the 1995 DEIR/EIS) for a discussion of the alternatives screening process. See also response to Comment E8-5.

Section D. Special Interest Groups

Letter D1

PCL

PLANNING AND CONSERVATION LEAGUE

STATE WATER RESOURCES CONTROL BOARD
1995 OCT 10 PM 2:52
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Maynard Munger, Moraga
Donald Murphy, Loomis
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J.William Yeates, Sacramento

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SAVE MOUNT DIABLO
SANCTUARY FOREST
TAMALPAIS CONSERVATION CLUB

October 4, 1995

Jim Sutton
Division of Water Rights
State Water Resources Control Board
PO 2000
Sacramento, CA
95812-2000

Dear Mr. Sutton:

We have received and reviewed the EIR-EIS for the Delta Wetlands Project. Thank you for sending us these documents.

It is clear that without some better form of management, the western Delta islands will soon be gone. Due to continued subsidence, the levees will fail in a flood, or be demolished in an earthquake. With the failure of the levees, more unproductive Frank's Tracts will be created, damaging the Delta environment and threatening the abilities of the State Water Project and the Central Valley Project (and Contra Costa County) to divert water from the Delta.

The Delta Wetlands project is a creative attempt to continue the economic and environmental benefits of the islands. It is clear that the conversion of Bouldin Island and Holland Tract would be of great benefit to fish and wildlife. It also appears that, with proper mitigation of impacts on fisheries and water quality, that the use of Webb Tract and Bacon Island for reservoirs would be acceptable from an environmental point of view. D1-1

Overall, the Delta Wetlands proposal is creative and innovative. Now it is up to the Board and the Corps of Engineers to set conditions which mitigate any significant environmental impacts, and then permit the project to move forward. Once you have acted, Delta Wetlands will be free to negotiate the sale of stored water to a variety of buyers.

Thank you for considering these comments.

sincerely,

Gerald H. Meral

Gerald H. Meral
Executive Director

926 J Street, Room 612, Sacramento, CA 95814 916-444-8726 FAX 916-448-1789

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Planning and Conservation League

D1-1. The lead agencies acknowledge this comment supporting the project.

State of California

Before the State Water Resources Control Board

DELTA WETLANDS PROJECT

DELTA WETLANDS (JOHN WINTHER ET AL.), APPLICANT

WATER RIGHT APPLICATIONS 29061, 29062, 29063, 29066 AND 30267, 30268, 30269 and 30270

PETITIONS TO CHANGE THE APPLICATIONS; AND APPLICATION TO THE U.S. ARMY CORPS OF ENGINEERS FOR A PERMIT PURSUANT TO SECTION 404 OF THE CLEAN WATER ACT AND SECTION 10 OF THE RIVERS AND HARBORS ACT IN CONTRA COSTA AND SAN JOAQUIN COUNTIES

BAY DELTA ESTUARY THENCE PACIFIC OCEAN

DRAFT ENVIRONMENTAL IMPACT REPORT AND DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR DELTA WETLANDS PROJECT

ONE DAY HEARING OF OCTOBER 11, 1995

WRITTEN COMMENTS BY THE CALIFORNIA SPORTFISHING PROTECTION ALLIANCE

A one-day hearing will be held on October 11, 1995 by the State Water Resources Control Board (hereinafter known as "SWRCB") to receive comments on the draft EIR/EIS for the proposed Delta Wetlands Project. The SWRCB and the U.S. Army Corps of Engineers (herein after known as "USACE") will take oral and written comments regarding the draft EIR/EIS at the hearing.

The following are the comments of the California Sportfishing Protection Alliance (herein after known as "CSPA") regarding the draft EIR/EIS for the proposed Delta Wetlands Project:

1. The CSPA filed protests against the above mentioned water right applications.

2. The CSPA filed scoping comments on the draft EIR/EIS for the proposed project as the project was proposed.

3. The CSPA received the draft EIS/EIR in mid September. The deadline date for submitting written comments to the draft EIR/EIS is November 21, 1995 or about 40 days.

We believe this one day hearing is premature because the "box" of environmental documents contains about 2,000 pages of data and information which must be reviewed by me. Consequently, we cannot at this time provide written comments concerning the adequacy of the draft EIR/EIS. **D2-1**

4. However, we do have one comment to make to the SWRCB and the USACE. It is our understanding that the developer(s) of the proposed Delta Wetands Project propose to sell the project to the Department of Water Resources (herein after known as "DWR"). Consequently, it appears that the DWR will operate the project differently than what is stated in the draft EIR/EIS. If that is the case, the Draft EIR/EIS must disclose this information, including the proposed day to day operations of the Delta Wetlands Project by the DWR, and mitigate the direct, indirect, and cumulative environmental impacts to the public trust resources to less than significant. In the event the developers do not sell the project until after they obtain the water right permits from the SWRCB for the proposed project, the SWRCB and the USACE must prepare an additional subsequent EIR/EIS which discloses the proposed "new" daily operations of the project by the DWR; the direct, indirect, and cumulative impacts to the environmental (public trust resources); with mitigation measures which reduces significant direct, indirect and cumulative impacts to less than significant. **D2-2**

5. The Delta Wetlands Project should only be allowed to store water at the proposed reservoirs only when water in the Bay Delta Estuary exceeds the "new" water quality standards for the Bay Delta Estuary or any additional "new" water quality standards either ordered by the SWRCB or ordered by the courts. This should be included as an alternative in the Draft EIR/EIS. **D2-3**

Please give the above mentioned comments serious consideration and weight, and place them into the record for the one-day hearing.

Respectfully Submitted

Robert J. Baiocchi, Consultant
For: California Sportfishing Protection Alliance
P.O. Box 357
Quincy, CA 96971
Bus Tel: 916-283-3767 (Quincy Office) or 916-836-1115 (Graeagle Office) or 916-283-1007 (Law Office); Fax: 916-283-4999 or 916-283-5017

Dated: October 7, 1995

CERTIFICATE OF SERVICE

State Water Resources Control Board
Division of Water Rights
Attn: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers
Regulatory Branch
Attn: Jim Monroe
1325 J Street, Room 1444
Sacramento, CA 95814-2922

Jim Canaday, Environmental Unit
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

Gary Bobker
The Bay Institute of San Francisco
625 Grand Avenue, Suite 250
San Rafael, CA 94901

David Yardas
Environmental Defense Fund
Rockridge Market Hall
5655 College Avenue
Oakland, CA 94618

Arthur Feinstein
National Audubon Society
Golden Gate Chapter
590 Texas Street
San Francisco, CA 94107

Cynthia Koehler and David Fullerton
Natural Heritage Institute
114 Sansome Street, Suite 1200
San Francisco, CA 94104

Hal Candee
Natural Resources Defense Council
71 Stevenson Street, Suite 1825
San Francisco, CA 94105

Nat Bingham
Pacific Coast Federation of Fishermen's Association
P.O. Box 783
Mendocino, CA 95460

Barry Nelson
Save San Francisco Bay Association
1736 Franklin Street, 3rd Floor
Oakland, CA 94612

David Nesmith
Sierra Club
5237 College Avenue
Oakland, CA 94618-1414

Steve Volker
Sierra Club Legal Defense Fund
180 Montgomery Street, Suite 1400
San Francisco, CA 94104

Jim Crenshaw, President
California Sportfishing Protection Alliance
1248 East Oak Avenue, Suite D
Woodland, CA 95695

Bill Jennings, Chairman
California Sportfishing Protection Alliance
5637 North Pershing Avenue, Suite 2-A2
Stockton, CA 95207

Lorna Carriveau, President
Northern California Council Federation of Fly Fishers
California Sportfishing Protection Alliance
Board Member
801 Brookside Drive
Woodland, CA 95695

Mike Jackson, Counsel
California Sportfishing Protection Alliance
P.O. Drawer 207
Quincy, CA 95971-0207

Interested Parties

California Sportfishing Protection Alliance

D2-1. The SWRCB and USACE extended the comment period by 30 days (to December 21, 1996) in response to this and other requests.

D2-2. Neither DWR, USBR, nor any other entity has made a proposal for purchase of the Delta Wetlands Project for which the lead agencies could reasonably assess the environmental effects. The commenter is correct in suggesting that additional environmental documentation would need to be completed if Delta Wetlands were to sell the project and a new project operator proposed project operations different from those discussed in the NEPA and CEQA documentation already completed for the project. Subsequent environmental analysis also could be required if any changes made to project operations would require further permitting or the modification of Delta Wetlands' water rights. The 1995 DEIR/EIS and the 2000 REIR/EIS both disclosed that additional environmental review of the project likely would be needed if project operations were to be integrated with SWP and CVP operations. See also Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

D2-3. The Delta Wetlands Project would always operate within the applicable water quality objectives. As described in Chapter 2 of the 1995 DEIR/EIS and of FEIS Volume 1, the 1995 WQCP was considered part of the baseline for assessing Delta Wetlands Project operations. The project alternatives were simulated under the objectives stated in the 1995 WQCP. The general rule is that the Delta Wetlands Project would be required to operate under all applicable standards for protection of Delta water quality, fish and wildlife uses, and other resources. It would be precluded from interfering with the ability of those who hold prior water rights to comply with Delta standards, whatever the prevailing standards may be (see page 3A-1 in Chapter 3A of the 1995 DEIR/EIS [page 3A-3 of FEIS Volume 1]).

SHASTA LAKE BUSINESS OWNERS' ASSOCIATION
COMMENTS PRESENTED AT THE PUBLIC HEARING FOR
THE DELTA WETLANDS PROJECT

SACRAMENTO, CALIFORNIA
OCTOBER 11, 1995

SPEAKER: ROGER LEFEBVRE
FIRST VICE PRESIDENT

My name is Roger Lefebvre. I am the first vice president of the Shasta Lake Business Owners' Association.

Businesses directly located or involved on Shasta Lake employ in excess of 650 people, over 200 of which are permanent employees, throughout the year. These figures do not account for residual employment, such as gas stations, restaurants, grocery, and outside area service businesses that support the lake.

Tourism on Shasta Lake, which amounted to 6.4 million visitor days in 1994, is very closely related to the water level in Shasta Lake. When the water level is high, like this year and 1993, recreational use of Shasta Lake is also high. As the water level drops in the reservoir, the tourists lose interest and go elsewhere.

We view the Delta Wetlands Project as an opportunity to provide a new source of water to fill downstream demands without putting additional pressure on the water supply in Shasta Lake. It is very important to us that the Delta Wetlands Project is producing wildlife benefits and that there are no fisheries impacts without suitable mitigation measures. **D3-1**

The Draft Environmental Impact Report for the project appears to be very thorough and comprehensive. It is our hope that the responsible permitting and regulatory agencies move this project forward as soon as possible.

Thank you for the opportunity to make these comments.

Roger Lefebvre
First Vice President
Shasta Lake Business Owners' Association.
P.O. Box 709, Lakehead, Ca. 96051

Shasta Lake Business Owners' Association

D3-1. The lead agencies acknowledge this comment supporting the project. Because this letter does not specifically comment on the environmental analysis in the 1995 DEIR/EIS, no response is required.

Letter D4

California Striped Bass Association

P.O. Box 591 Bethel Island, CA 94511

State Board

October 15, 1995

(510)684-3199
Fax(510)684-3024

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
PO Box 2000
Sacramento CA 95812-2000

Subject: Delta Wetlands Project

Gentlemen:

The California Striped Bass Association, with seven chapters from Fresno to Sacramento and representing thousands of anglers, has concerns regarding the potential damage this project could cause to the Delta.

Taking water from the Delta and storing it on lands that have been used for farming, some light industrial and cattle ranching has the potential of severely contaminating this water. Over a period of years the soils have been fertilized, various insecticides have been used and cattle ranching has left the soils contaminated; i.e. in Tomales Bay when there is an abnormally high rainfall the oyster industry has to curtail oyster farming due to the contaminated runoff from range cattle. We've all heard of DDT and a whole host of insecticides that have been banned over the years. Surely, these leave residuals in the soil. Pumping stored water from these soils back into the Delta will positively add to the extinction of more species of fish and wildlife. Also, there are millions of humans that rely on the Delta as their source of drinking and household water. D4-1

Storage of water on these islands raises a potential for levee failure from inland wave action. There are many levees in the Delta now that have failed. Why would anyone have the power to add to this danger? A levee failure would increase the salinity of the drinking water obtained from the Delta. Flooding these islands will have a tendency to put pressure on neighboring islands which could cause levee failure or increased levee maintenance at a substantial cost to landowners and California taxpayers. The small amount of water that could be generated from this flooding will not in any way help with any problems the Delta has with its fishery and wildlife. This project will only put money in the pockets of a few investors and make them a nice duck club. D4-2

California Striped Bass Association strongly opposes this as we have in the past. No matter how you fortify the levees, the potential for disaster is still there. We do not feel a permit should be allowed for this project. A reply would be appreciated.

Sincerely,

CALIFORNIA STRIPED BASS ASSOCIATION

Ralph Draudson
President

cc: U. S. Army Corps of Engineers
Regulatory Branch

California Striped Bass Association

D4-1. See response to Comment C9-41.

D4-2. The commenter is referring to information or analysis in the 1995 DEIR/EIS that was replaced or augmented by information or analysis in the 2000 REIR/EIS. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents an evaluation of levee stability for the Delta Wetlands reservoir levees and of worst-case levee failure. See also response to Comment C10-1.

CENTRAL VALLEY HABITAT JOINT VENTURE

North American Waterfowl Management Plan

California Waterfowl Association

Ducks Unlimited

National Audubon Society

The Nature Conservancy

October 30, 1995

Mr. Jim Monroe
U.S. Army Corps of Engineers
Regulatory Branch
1325 J Street, 14th Floor
Sacramento, CA 95814

Dear Mr. Monroe:

It is the policy of the Central Valley Habitat Joint Venture Management Board (Board) to refrain from commenting on development projects of any kind. However, in consideration of the exceptionally large acreage of land in the Delta which will be affected by the Delta Wetlands Project, and the impact of the completed project on the attainment of the Joint Venture's Delta restoration and protection goals, the Board has chosen to make an exception in this case.

The Draft Environmental Impact Statement/Report for the project indicates that the mitigation for the periodic inundation of Webb Tract and Bacon Island, which will occur on Bouldin and Holland Farms, will include 2,073 acres of seasonal wetlands, 1,530 acres of agricultural/wetlands, and 2,589 acres of commercially produced corn and wheat of which 30 percent of the corn will be left standing and 50 percent of the wheat. There are also several other forms of mitigation such as post-harvest flooding, the construction of brood ponds, the establishment of tall riparian habitat at a 3:1 ratio, and sequential flooding and draining of agricultural fields to optimize shorebird and goose feeding opportunities. Given that only approximately 10 acres of seasonal wetlands and 100-150 acres of riparian habitat will be lost as a result of project implementation, and that the loss of waste grain will be more than compensated for on the mitigation islands, the Board has concluded that the proposed mitigation measures will result in significant net wetland benefits to Delta waterfowl resources. The Board, of course, would be opposed to the transfer of any "excess" mitigation habitat as credit to compensate for any other past, current, or future project. **D5-1**

In addition, the Board is pleased to note that the acreage of restored wetlands in excess of that needed to compensate the loss of existing wetlands, on a 1:1 basis, may be credited toward meeting the Joint Venture's objective of

protecting 3,000 acres of wetlands, and the restoration of an additional 20,000 acres of habitat within the legal boundaries of the Delta. **D5-1 cont'd**

Although the Board strongly supports the project sponsors' wetland restoration proposals and applauds their innovative approach to enhancing the wildlife values derived from modified agricultural practices, we wish to make it clear that our support of these factors does not constitute an endorsement of the entire Delta Wetlands Project. Many complex issues regarding fish protection and passage, water quality, and water transport through and south of the Delta have yet to be resolved. The purpose of this letter is limited to notifying the lead agencies that in our considered opinion the completed wetland mitigation features would result in a significant and much needed net benefit to wetland dependent species in the Delta.

Should you have any questions regarding this letter, please telephone me at (916) 648-1406.

Sincerely,

Bill Gaines, Chairman
Central Valley Habitat Joint Venture

cc: CVHJV Management Board
David Behar
Greg Thomas
Rich Golb
Dan Nelson
Roger Patterson
Wayne White
Tim Quinn
C. F. Raysbrook
David Kennedy
Bob Potter

Central Valley Habitat Joint Venture

D5-1. The lead agencies acknowledge this comment that recognizes the benefits to wetlands and waterfowl of implementing the HMP for the Delta Wetlands Project. Chapters 3G, "Vegetation and Wetlands", and 3H, "Wildlife", describe these benefits in detail.

JES

Letter D6

CALIFORNIA **URBAN WATER** AGENCIES

November 1, 1995

Mr. Jim Sutton
California State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95818-2000

Mr. Jim Monroe
U.S.Army Corps of Engineers
Regulatory Branch
1325 J Street, 14th Floor
Sacramento, CA 95814

RE: Request For Comment Deadline Extension on Delta Wetlands EIR

Dear Sirs:

Members of the California Urban Water Agencies are attempting to coordinate their reviews and comments on the Draft DEIR/ EIS for the Delta Wetlands Project. To enable us to provide constructive and coordinated comments on the DEIR/EIS, CUWA requests that the State Board and Army Corps of Engineers extend the comment period for comment on the Project until January 10, 1996. This important project has many implications regarding water quality, water supply, environmental and other Project impacts which must be carefully examined and cooperatively resolved. In that spirit, the CUWA member agencies have determined they need additional time to perform analyses to support constructive commentary which can otherwise help resolve areas of conflict. **D6-1**

Please contact me if you have any questions or concerns. I would appreciate any advance notification you can give regarding the ability to extend the deadline for comments.

Sincerely,

Byron M. Buck
Executive Director

455 CAPITOL MALL, #705, SACRAMENTO, CA 95814 916•552•2929 FAX 916•552•2931

California Urban Water Agencies

D6-1. The SWRCB and USACE extended the comment period by 30 days (to December 21, 1996) in response to this and other requests.

CALIFORNIA WATERFOWL ASSOCIATION
4630 NORTHGATE BOULEVARD • SUITE 150 • SACRAMENTO, CA 95834
(916) 648-1406 • (916) 648-1665 FAX

"Preserving California's waterfowl, wetlands, and outdoor heritage... since 1945."

1945-1995
50th Anniversary

November 20, 1995

Mr. Jim Sutton
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

Dear Mr. Sutton:

The California Waterfowl Association (CWA) is pleased to submit brief comments on the Draft Environmental Impact Report for the Delta Wetlands Project. It is important to recognize that our comments are limited to those aspects of the project pertaining waterfowl and their habitats.

CWA, organized in 1945, is an 11,000 member statwide conservation organization dedicated to the preservation, enhancement and restoration of California's waterfowl and wetlands. We have active programs in the areas of education, outreach, research and goverment affairs.

Our specific comments are as follows:

1. The Habitat Management Plan (HMP) is an aggressive approach to the management of nearly 9,000 acres for the benefit of waterfowl and other wetland-dependent species. It is important to note that 24 species of special concern can benefit from this newly created habitat. We recognize that the final plan will include some fine-tuning, which should stress the importance of ground-nesting birds, including waterfowl. This should involve the construction of additional nesting islands as well as spring/summer flooded wetlands that provide cover and food for ducklings and young of other wetland-dependent species. **D7-1**

2. CWA also believes that the elimination of "spud" ditches will improve survival of ducklings that might otherwise be trapped in these ditches. We recognize **D7-2**

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this may reduce agricultural productivity, but we feel that there is more than enough food produced on the islands to accommodate this minor tradeoff. **D7-2 cont'd**

3. CWA's greatest concern relates to the high probability of significant botulism and/or avian cholera outbreaks in the closed-to-hunting zones. The best management plan would be to allow light hunting in those areas in order to encourage a more even distribution of wildlife use on the two habitat islands. The closed zones may also reduce hunting quality on neighboring islands. **D7-3**

Thank you for the opportunity to submit these comments.

Sincerely,

Walter R. Sikes
Executive Director

WRS/cs

California Waterfowl Association

D7-1. Development of waterfowl breeding habitat is described on pages 5–6 and in Table 2 of the HMP (Appendix G3). The plan includes development of brood ponds and nesting cover. Delta Wetlands, however, is not required to mitigate the loss of nesting waterfowl habitat because the project would affect only limited and poor-quality nesting habitat.

D7-2. As described in Table 2 of the HMP (Appendix G3), Delta Wetlands is committed to modifying spud ditches to reduce the likelihood of duckling mortality caused by entrapment in ditches. The HMP requires cultivation of wheat, and the elimination of spud ditches may not be compatible with that goal (see Table 2 in the HMP). However, management of the habitat islands to meet HMP objectives could include the elimination of spud ditches if it is feasible to continue cultivating wheat. Also, as noted in response to Comment A5-8, the HMP can be amended to change habitat types and management practices in future years if monitoring data indicate that such changes would continue to meet the goals of the HMP.

D7-3. The commenter is concerned about the possibility of botulism and avian cholera outbreaks in areas closed to hunting and the effects of such areas on hunting quality on neighboring islands. The Delta Wetlands Project islands would be monitored for outbreaks of botulism or other waterfowl diseases, as described on page 3H-26 of the 1995 EIR/EIS (page 3H-28 of Chapter 3H of FEIS Volume 1) under "Mitigation Measure H-3: Monitor Waterfowl Populations for Incidence of Disease and Implement Actions to Reduce Waterfowl Mortality". If a disease outbreak is detected before, during, or after waterfowl season in zones closed to hunting, Delta Wetlands would consult with DFG and USFWS to develop strategies to reduce mortality. Hunting or hazing in zones closed to hunting is not precluded as a potential management action, but such a change in habitat island management would have to be justified as described under "Management Monitoring Programs and Performance Standards" on pages 21–22 of the HMP (Appendix G3). The potential change in waterfowl use patterns is described as a less-than-significant impact; see Impact H-21 on page 3H-27 of the 1995 DEIR/EIS (page 3H-30 of FEIS Volume 1).

F.O.R.
FRIENDS OF THE RIVER

Letter D8

November 27, 1995

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1325 J Street, Room 1444
Sacramento, Ca. 95814-2922

Re: Delta Wetlands Project

Dear Mr. Monroe

Friends Of The River recognizes the benefits that could occur from the development of the DW project.

The Delta islands have subsided substantially since the mid 19th century due to the continuous erosion of topsoil and the oxidization of organic soil resulting from intensive agricultural practices. The DW project would significantly slow the subsidence process by reducing agricultural use through water storage and habitat management. This would also reduce the cost of levee maintenance as the levees would no longer need to be built to greater heights to compensate for subsidence.

The creation of water storage on Delta islands by the DW project could offset the need to dam free flowing rivers. This alternative of storing water in an area previously degraded by agriculture would be much less detrimental to the environment than the damming of a river rich in biological diversity.

However, Friends Of The River cannot support the DW project unless specific conditions are met in order to meet the needs of the natural environment of the Delta. These conditions involve.

* The export of water into the DW project must not exceed a level which would become harmful to the Delta's native and migratory fish species and other aquatic species. **D8-1**

* The DW project must allow for pulse flows so that appropriate quantities of fresh water can be passed through the Delta to lessen salinity and improve anadromus fish passage. **D8-2**

* While in operation, the DW project must yield sufficient water to the environment to compensate for periods of island filling and when water is diverted for export. **D8-3**

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We hope that you recognize the crucial need for these conditions. The Delta Wetlands project could be positive, however steps must be taken to ensure that it does not worsen the problems that this region has been historically subject to. The Delta is a unique ecosystem which has been under man made stress for over a century. Due to the Delta's ecological importance the utmost consideration must be taken before a project such as this can be implemented.

Sincerely

Roy Swanson
Conservation Assistant

Friends of the River

D8-1. Since this comment letter was submitted, the lead agencies have concluded formal consultation with DFG, NMFS, and USFWS on the effects of the Delta Wetlands Project on listed fish species. As part of the consultation process for compliance with the federal and California ESAs, USACE, the SWRCB, NMFS, USFWS, DFG, and Delta Wetlands agreed on the project operating parameters referred to as the FOC, which have been incorporated into the proposed project. DFG subsequently issued a no-jeopardy biological opinion regarding project effects on delta smelt and winter-run chinook salmon; NMFS issued no-jeopardy biological opinions regarding project effects on winter-run chinook salmon, Central Valley steelhead ESU, and Central Valley spring-run chinook salmon ESU and their habitats; and USFWS issued no-jeopardy biological opinions regarding project effects on delta smelt and splittail and their habitats. The biological opinions include RPMs to reduce or compensate for the incidental take of listed species. The FOC and RPMs reduce all potential project impacts on these species to a less-than-significant level and provide protections for nonlisted species. If the lead agencies approve Delta Wetlands' permit applications, Delta Wetlands will be required to implement the terms of the biological opinions as part of its operating conditions. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for details about the formal consultation and discussion of the terms of the biological opinions.

D8-2. Delta Wetlands Project operations would not adversely affect flows identified for Delta fishery or other public trust benefits. See response to Comment B6-26.

Since this comment letter was submitted, the lead agencies have concluded formal ESA consultation with DFG, NMFS, and USFWS for project effects on listed fish species and their habitats. Biological resources that could be affected by Delta Wetlands Project operations will be protected by the mitigation measures described in the 1995 DEIR/EIS; they will also be protected by the FOC and RPMs that were developed through the consultation process and described in the no-jeopardy biological opinions issued by DFG, NMFS, and USFWS. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

D8-3. Operation of the Delta Wetlands Project would be consistent with the objectives of the 1995 WQCP. Additionally, the ESA consultation for the project addressed specific measures to ensure the provision of sufficient flows for environmental purposes. As part of the formal consultation process on the Delta Wetlands Project's effects on protected fish species, Delta Wetlands, the SWRCB, USACE, DFG, NMFS, and USFWS cooperatively developed operating parameters (referred to as the FOC) for the project to ensure the protection of aquatic species. The FOC include many specific measures that define the flow and water quality conditions under which project diversions and discharges would be allowed; they also describe mitigation that Delta Wetlands has agreed to incorporate into the proposed project.

CALIFORNIA SPORTFISHING PROTECTION ALLIANCE
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QUINCY, CALIFORNIA 95971

State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

December 13, 1995

U.S. Army Corps of Enginners
Regulatory Branch
1325 J Street, 14th Floor
Sacramento, CA 95814

Attn: Jim Sutton, Environmental Unit, Division of Water Rights, SWRCB; and Jim Monroe, Regulatory Branch, U.S. Army Corps of Engineers

Re: Delta Wetlands Project, Draft Environmental Impact Report and Environmental Impact Statement; Comments by the California Sportfishing Protection Alliance, Protestant.

The Project

Delta Wetlands Properties (DW) proposes a water storage project on four (4) islands on the Sacramento-San Joaquin Delta. The project would involve diverting and storing water on two of the islands (Bacon Island and Webb Tract - "reservoir islands") and seasonally diverting water to create and enhance wetlands and to manage wildlife habitat on the other two islands (Bouldin Island and Holland Tract - "habitat islands"). DW proposes constructing recreation facilities along the perimeter on all four DW project islands; operating a private airstrip on Bouldin Island; and, during periods of nonstorage, managing shallow water, which may provide wetlands habitat values on the reservoir islands. The DW project islands are owned either wholly or partially by DW. To operate its project, DW would improve and strengthen leeves on all four islands and install additional siphons and water pumps on the perimeters of the reservoir islands. DW would operate the habitat islands primarily to support wetlands and wildlife habitat.

The purpose of the DW project is to divert surplus Delta inflows, transferred water, or banked water for later release for Delta export or to meet water quality or flow requirements for the San Francisco Bay/Sacramento-San Joaquin Delta (Bay Delta) estuary.

Water Rights Issues

1. The SWRCB is holding workshops to discuss water rights and what entities will be responsible for meeting the new water quality standards for the Bay Delta. A water rights hearing will follow the workshops in determining the water users that will be required to the meet the new water quality standards for the Bay Delta.

In order to determine the direct, indirect, and cumulative impacts to the public trust resources of the Bay Delta Estuary resulting from the proposed DW project, and other projects who may be responsible for meeting the water quality standards for the Bay Delta, the new information (SWRCB Board Decision - Hearing Record) as a result of the proposed Bay Delta Water Rights Hearing should be evaluated in a subsequent EIR/EIS for the DW Project. The Draft EIR/EIS is deficient without this new information. D9-1

2. One of the purposes of the DW Project is to store surplus water. The determination of whether there is surplus water available in the Bay Delta for the DW Project cannot be determined until the SWRCB makes a decision at the proposed Bay Delta Water Rights Hearing. The Draft EIR/EIS is deficient without this new information. D9-2

3. Another purpose of the DW Project is to store transferred water or banked water for later sale and/or release for Delta export or to meet water quality or flow requirements for the Bay Delta Estuary.

The Draft EIR/EIS did not evaluate the cumulative impacts to the public trust resources in the Sacramento River watershed and the San Joaquin River watershed from water transfers and/or banking water to the reservoir islands (points of storage and diversion to the point of storage at the DW reservoir islands). The Draft EIR/EIS should disclose the specific reservoirs where the transferred and/or banked water is stored, and the Draft EIR/EIS should evaluate the resulting cumulative impacts to the public trust resources in the watershed where the reservoirs are located. The Draft EIR/EIS is deficient without this disclosure, and is also deficient because the document failed to evaluate the cumulative impacts to public trust resources resulting from water transfers and/or water banking in specific watersheds where the reservoirs are located. D9-3

Transferring water under the California Water Code is exempt from the requirements of the California Environmental Quality Act and its Guidelines. Consequently, the cumulative impacts to the public trust resources associated with using the DW storage reservoirs for transferred and/or banked water from sources in the Sacramento River and San Joaquin River watersheds should be evaluated in the Draft EIR/EIS.

For the purposes of the CSPA comments, public trust resources means: chinook salmon (all species and life stages); steelhead (all life stages); Delta smelt (all life stages); longfin smelt (al life stages); Sacramento Splittail (all life stages); American shad (all life stages); striped bass (all life stages); resident trout (all life stages) (located in reservoirs or in upstream areas above the lowest dams in the Sacramento and San Joaquin rivers watershed); other fish species (all life stages); recreation (reservoirs and watersheds; all types of recreation such as fishing, boating rafting, etc.), riparian habitat (all plant species); rare, threatened and endangered species (all life stages and their habtat); water quality (for public water supplies, fishery and aquatic resources); and other public trust resources not mentioned. **D9-3 cont'd**

4. A number of counties hold entitlements to store, divert, and use water in the Sacramento River and San Joaquin River systems. Many of the county entitlements are for domestic, irrigation, industrial, stockwatering, fish culture, fish and wildlife, and other beneficial uses. The proposed DW Project may interfere substantially with the water right entitlements those counties hold. This water right issue was not disclosed and evaluated in the Draft EIR/EIS. The Final EIR/EIS should evaluate those entitlements and the associated impacts to the areas of origin water right entitlements for all project alternatives including the no project alternative. **D9-4**

We reference Section 1215 et seq. of the California Water Code under Article 1.7. Areas of Origin.

5. The Draft EIR/EIR did not disclose the places of use where DW Project water will be put to beneficial use. We believe the Final EIR/EIS must disclose the specific places of use where DW water will be used. We believe the SWRCB cannot issue a water right permit without site specific knowledge and detailed information as to the specific places of use where DW water will be put to beneficial use. **D9-5**

The Draft EIR/EIS also did not disclose, evaluate, and mitigation cumulative impacts to the environment at the specific places of use. The Draft EIR/EIS is deficient without this disclosure and evaluation.

Water Transfers and Water Banking

6. Water transfers and water banking have occurred and will continue to occur without the need for the DW Project. The Final EIR/EIS should disclose this information. **D9-6**

Potential Sale of DW Project to the Department of Water Resources (State Water Project) and/or U.S. Bureau of Reclamation (Central Valley Project)

7. The DW Project may be sold to the Department of Water Resources and/or U.S. Bureau of Reclamation. The DW Project may be managed differently by the Department of Water Resources and/or U.S. Bureau of Reclamation for SWP and CVP purposes. The Final EIR/EIS should disclose that a subsequent EIR/EIS will be prepared for the DW Project upon its sale to the Department of Water Resources and/or U.S. Bureau of Reclamation for the purposes of either the SWP or the CVP. D9-7

Potential DW Operation Changes - Department of Water Resources and U.S. Bureau of Reclamation

8. The Draft EIR/EIS briefly discusses the potential for the Department of Water Resources and the U.S. Bureau of Reclamation to modify their operations in conjunction with the operations of the DW Project. The Draft EIR/EIS states that the releases from Shasta and Oroville reservoirs could be decreased during the period when project islands are discharging. Reductions in releases below Keswick and the accompanying higher water temperature immediately downstream in the Sacramento River has the potential to cumulatively and adversely impact winter-run chinook salmon as well as spring-run chinook salmon. Such cumulative impacts should be disclosed andevaluated in the Final EIR/EIS, and should also be mitigated to less than significant. D9-8

We believe that any changes in DW project operations beyond the scope of the proposed DW Project should require an additional CEQA document such as a subsequent EIR/EIS.

Sacramento River and Feather River - Changes in Upstream Storage and Flow Releases

9. Export pumping of DW water supplies by the SWP and CVP could allow greater reservoir carryover storage. Increased carryover storage could allow greater control of flow and water temperature below Keswick and could potentially improve fishery resources in SWP or CVP reservoirs. However, a reduction in downstream river flows resulting from DW - SWP - CVP operation changes has the potential to have adverse cumulative impacts on all life stages of salmonids. The Draft EIR/EIR did not evaluate the potential cumulative impacts to all life stages of salmonids in the Sacramento River and the Feather River from DW - SWP - CVP operational changes. A hydrology model should be prepared and included in the Final EIR/EIS which shows changes in flows in the Sacramento River and the Feather River as a result of DW, DWR, and USBR operational changes in conjunction with biological evaluations which shows the resulting cumulative impacts to salmonids with mitigation measures. D9-9

Reduced flows from DW - SWP - CVP operation changes has the potential to have cumulative impacts such as: strand juvenile fish, increase river temperatures, and reduce transport flows for fish spawning above Sacramento such as striped bass. The Draft EIR/EIS did not evaluate the cumulative impacts to striped bass (all life stages) resulting from DW - SWP - CVP operational changes. A hydrology model should be prepared and included in the Final EIR/EIS which shows changes in flows in the Sacramento River and the Feather River as a result of operational changes in conjunction with biological evaluations which shows the resulting cumulative impacts to salmonids with mitigation measures. D9-9 cont'd

Reduced flows in the Sacramento River and the Feather River from DW - SWP - CVP operational changes also has the potential to cause cumulative impacts to American shad populations and habitat (all life stages), with a resulting cumulative impact to sportfishing. The Draft EIR/EIS did not evaluate the potential cumulative impacts to American shad populations and habitat (all life stages), and sportfishing. The Draft EIR/EIR should be amended to include the cumulative impacts to American shad and sportfishing resulting from DW - SWP - operational changes.

Fish and Wildlife Species and Their Habitat

10. The proposed DW Project, as presently described, does not appear to jeopardize the continued existence of the greater sandhill crane and Swainson's hawk. However, winter-run chinook salmon and Delta smelt may be jeopardized due to the direct impacts of project operations and indirect impacts of operational changes in the Bay Delta.

Additional information should be included in the Final EIR/EIS on project alternatives and conservation measures which must eliminate or significantly reduce incidential take and offset unavoidable impacts in order to avoid a jeopardy finding. Public Trust resources protection measures should be included in the Final EIR/EIS such as modifying the DW Project operations during periods when winter-run chinook salmon, Delta smelt, or Sacramento splittail may be impacted; restrictions on other operational changes that could be adverse to these species; and acquisition and development of suitable shaded riverine aquatic and shallow shoal habitat to replace that lost due to the proposedn DW Project. D9-10

The CSPA believes that the Draft EIR/EIS does not provide the DFG, USFWS, and USNMFS with the necessary information to issue written findings for the State and Federally listed winter-run chinook salmon, Delta smelt, and the federal candidate Sacramento splittail. We strongly recommend that the Biological Opinion in the Draft EIR/EIS is amended to include appropriate compensation measures

acceptable to the state and federal fish and wildlife agencies that in fact protect these species and their habitat. D9-10 cont'd

Salinity Habitat

11. The discussion in the Draft EIR/EIS for Fishery Resources (Chapter 3F) and the Biological Assessment for impacts to fish species (Appendix F-2) contains an analysis of fishery impacts. We have concerns about three areas of the analysis. Those being: changes in the area of optimal salinity habitat, the entrainment risk for winter-run chinook salmon and other Sacramento River races of salmon, and the determination of impact significance.

One factor of optimal salinity habitat is not disclosed and evaluated in the Draft EIR/EIS is habitat quality. Factors such as the percentage of the area that is shallow shoal habitat, adjacent SRA habitat and tidal wetlands, and the percentage of the areas within the influence of the State Water Project and the Central Valley Project export facilities are not adequately assessed. All of these factors contribute to the quality of optimal salinity habitat. Without consideration of these factors, conclusions reached about net changes in this habitat can be misleading. D9-11

The DW Project as described in the Draft EIR/EIS will result in a significant reduction in the quality and volume of optimal salinity habitat for Sacramento splittail, long-fin smelt, and Delta Smelt. Measures to eliminate these impacts should be included in the Final EIR/EIS.

Predation and Entrainment - Fishery and Aquatic Resources

12. The Draft EIR/EIS discloses avoidance measures and fish screens to be implemented by DW. However, chinook salmon, Delta smelt, long-fin smelt, Sacramento splittail, and other fish species have the potential to be lost during DW project filling and subsequent releases for export and other project purposes. Increased predation is likely to occur at intake and drain stations and recreational boat dock structures. D9-12

Significantly more details need to be developed and included in the Final EIR/EIS before the adequacy of the fish screens can be determined for the DW Project. DW should work with the DFG, USFWS, and USNMFS to ensure that the fish screens installed meet applicable screening criteria and be fully protective of fishery resources. The fish screens need to be designed to address and meet the 0.2 feet per second criteria currently being used by the USFWS. The Final EIR/EIS should include a fish screen maintenance plan.

The CSPA believes that all DW Project siphons and pumps should be screened with state of the arts fish screens to prevent entrainment to fish species (all life stages). The Final EIR/EIS should disclose the number of DW siphons and pumps, and the number that will be screened with state of the arts fish screens. For those siphons and pumps which will not be screened, the Final EIR/EIS should include an estimate of losses of fish species, and the reasons why those siphons and pumps will not be screened. D9-12 cont'd

Fish screens are not 100% effective in preventing entrainment. The Final EIR/EIS should disclose the number of specific fish species (all life stages) that will be entrained with the proposed fish screens. And how those fish losses will be mitigated to less than significant. Considering the status of the public trust fisheries of the Bay Delta, the loss of one fish is significant to the public.

Aquatic Habitat - Franks Tract, Santa Fe Cut, and the Delta

13. The Draft EIR/EIS states that a 5% increase in annual boater use-days is expected at project build-out (page 31-14). The increased erosion due to the higher number of boats in the Delta has the potential to adversely impact SRA habitat throughout the Delta. Reservoir island discharges may increase channel velocities and erode channel islands on the northeast side of Franks Tract and in Santa Fe Cut. D9-13

The Final EIR/EIS should disclose, evaluate, and mitigate impacts to aquatic habitat as noted above from increase erosion resulting from the DW Project, including the potential impacts to channel islands on the northeast side of Franks Tract and in Santa Fe Cut.

Dissolved Oxygen Levels - DW Project Operations

14. DO levels below 6.0 mg/l can interfere with the movement of fish such as adult chinook salmon. When DO is less than 7 mg/l in channels adjacent to reservoir islands releases from storage should be monitored during DW project releases to ensure that adjacent channel DO does not decrease to DO levels below 6.0 mg/l. If levels drop below 6.0 mg/l project releases should cease until channel DO lever are greater than 6.0 mg/l. D9-14

The Final EIR/EIS should disclose, evaluate, and mitigate the DO issue as noted above.

SRA Habitat - External Levees

15. The Draft EIS/EIR did not adequately disclose potential adverse impacts to fish, wildlife, and riparian habitat due to reconstruction or maintenance of the island levees. D9-15

The Final EIR/EIR should disclose that riparian, fisheries, and wildlife habitats were adversely impacted on DW Project islands under the SB 34 program during the period 1987-1991, but that all shrub-scrub, freshwater marsh, and riparian forest impacts including anticipated future impacts were mitigated off-site at Medford Island. However, mitigation for the loss of approximately 9,000 feet of SRA habitat should be part of the proposed DW Project. The Final EIR/EIS should disclose, evaluate, and mitigate the loss of approximately 9,000 feet of SRA habitat. D9-15 cont'd

Delta Berm Islands

16. The Draft EIR/EIS discusses the DW Project effects on hydrology, vegetation, and wildlife on the interior and along the water-side of the levees of the four project islands. However, the Draft EIR/EIS did not adequately disclose, evaluate, and mitigate the effects on instream channel islands or berms that surround the project islands.

Channel islands and berms provide habitat for a high diversity of endemic plants and animals and are remnants of what was once a dominant habitat in the Delta. Berm islands are subjected to numerous forces that are impacting their habitat quality and quantity. Peat mining, wave wash from passing boats, and scour from increased water velocities cumulatively contribute to the erosion and habitat degradation of those islands. D9-16

The Draft EIR/EIS (page 3B-5) states that "Diversion and export pumping can also increase channel velocities". The proposed DW recreational facilities have the potential to significantly increase the number of boaters and wave wash affecting the surrounding channels. Increases in-channel water velocities and recreational boaters could cause significant impacts to berm islands and significantly decrease habitat for sensitive species. The potential for these significant impacts were not adequately disclosed, evaluated, and mitigated in the Draft EIR/EIS. The Final EIR/EIS should disclose, evaluate, and mitigate these impacts with adequate mitigation measures. This should include the berm islands located in other Delta channels that have the potential to be adversely impacted by the proposed DW Project.

Cumulative Growth Inducing Impacts of the DW Project

17. The Draft EIR/EIS did not disclose and evaluate potential adverse cumulative service area impacts and cumulative growth inducing impacts of the DW Project. The growth inducement can result from either the increased exports facilitated by the DW Project or the improved reliability that may be provided by the DW Project. Increased reliability is also a key to decisions related to urban and D9-17

industrial growth or agricultural growth. The Final EIR/EIS should disclose, evaluate, and mitigate the cumulative growth inducing impacts resulting from the DW Project in site specific areas where the water will be put to beneficial use.

The Final EIR/EIS should disclose a process for preparation of mitigation plans or regional multi-species plans and implementation of recommended mitigation measures to offset cumulative growth inducing impacts. These plans should disclose means to acquire sensitive habitats and key movement corridors throughout the DW Project service areas for listed and candidate species (CESA - FESA), and other public trust resources. An upper watershed restoration plan in areas above the dams in the Sacramento River watershed should also be included so that public water supplies for the SWP remain reliable and are not impacted by upper watershed erosion problems. i.e. Upper Feather River watershed; Plumas County. D9-17 cont'd

The DW Project sponsors should initiate, help fund, and participate in interagency planning efforts with local, state, and federal agencies and the public, such as Calfed and the Southern California Association of Goverments in funding and implementing the above mentioned mitigation plans. This coordinated planning group could implement a comprehensive mitigation plan for affected areas using funds provided by DW project beneficiaries, such as a surcharge on delivered water and subdivision development fees.

No Project Alternative

17. The Draft EIR/EIS describes that the intensive agricultural alternative (no-project alternative) was used as the base for comparing DW Project alternatives. It is claimed that intensive agriculture is the alternative that will be implemented in the absence of DW Project approval rather than the existing condition. (See See Page 3F-10 - Last Paragraph)

The "No Project Alternative" in the Draft EIR/EIS is grossly deficient for the following reasons:

More water should be flowing into the Bay Delta as a result of a forth coming decision by the Board regarding the lower Yuba River. We reference CSPA Complaint against Yuba County Water Agency, et al. and 17 days of hearing before the SWRCB in 1992. That water could replace water transfers and water banking, and provide water for SWP and CVP purposes including water for water quality purposes for the Bay Delta without approving the DW Project. D9-18

More water should be flowing into the Bay Delta as a result of forth coming decision by the Board and the Federal Energy Regulatory Commission (FERC) regarding the lower Mokelumne River. We reference CSPA Complaint against East Bay

MUD and about 15 days of hearing before the SWRCB in 1992, including FERC modifications to Pardee and Camanche dams. The CSPA was an FERC intervenor in that process. That water and the above mentioned source of water could replace water transfers and water banking, and provide water for SWP and CVP purposes including water for water quality purposes for the Bay Delta without approving the DW Project.

More water will be flowing into the Bay Delta as a result of the recent FERC mediation agreement concerning the operations of the New Don Pedro Project on the lower Tuolumne River. The CSPA was an intervenor and a party to that agreement. That water and the above mentioned sources of water could replace water transfers and water banking, and provide water for SWP and CVP purposes including water for water quality purposes for the Bay Delta without approving the DW Project. D9-18 cont'd

The CVPIA provides for more water flowing into the Bay Delta from CVP reservoirs. That water and the above mentioned sources of water could replace water transfers and water banking, and provide water for SWP and CVP purposes including water for water quality purposes for the Bay Delta without approving the DW Project.

The SWRCB's water rights hearing regarding inflow into the Bay Delta should provide the water to meet the new water quality standards for the Bay Delta without approving the DW Project.

The "No Project Alternative" in the Draft EIR/EIS should be reevaluated to disclose, evaluate, and include the above mentioned sources of water that could replace water transfers, water banking, and additional DW storage without approving the DW Project.

Public Recreation Access - Bouldin Island and Holland Tract

19. The Draft EIR/EIR descibes the fact that there is a significant shortage of public recreational opportunities in the Delta, particularly for activities such as nature study, photography, wildlife viewing, and hunting. Also, because of the status of striped bass population in the Bay Delta, sportfishing for this species has been adversely impacted by the operations of the SWP and CVP. Consequently, striped bass population and sportfishing for striped bass could be cumulatively impacted by the operations of the DW Project. D9-19

There is a potential for including major public recreational benefits as a result of the proposed DW Project.

It is our understanding that the Department of Fish and Game may be proposing that a 700 acre public access area be designated on Bouldin Island and a 500 acre public access area be designated on Holland Tract which would be operated by the Department. The acreage proposed for public access areas on Bouldin Island and Holland Tract comprises only a small portion of each island; 12% of Bouldin Island and 17% of Holland Tract.

Activities such as hiking, nature study, photography, wildlife observation, and hunting could be provided in the above mentioned public access areas that would not interfere with the management of the islands by DW. Public hunting could be conducted under the limitations described in the HMP and would be compatible with activities in the private recreation areas. Also, improving conditions for striped bass through DW - SWP - CVP operation could improve striped bass populations for sportfishing purposes in the Delta. D9-19 cont'd

The Final EIR/EIS should disclose and evaluate the above mentioned public recreation access areas in Bouldin Island and Holland Tract.

Draft EIR/EIS - Impact Signifiance - CEQA and NEPA

20. The definition of signifiance will vary based on who is writing the CEQA/NEPA document, and also the setting of the project.

In the case of the DW Project, the setting is the San Francisco Bay/Sacramento-San Joaquin Delta as defined in Section 12220 of the California Water Code. CEQA Guidelines Section 15206 subd. (4)(E) states that the Delta is an area of critical environmental sensitivity which is of statewide, regional, and area wide signifiance. The importance to fish and wildlife resources in the Delta is also recognized nationally and internationally. Delta fish have been and are being significantly impacted by the operation of the SWP and CVP water projects. Consequently, the incremental impacts resulting from the DW Project must be considered as significant pursuant to the CEQA Guidelines. D9-20

Many of the conclusion reached in the Draft EIR/EIS which state that certain fishery impacts are less than significant are deficient. This is true for impacts to fishery resources of the Sacramento River system such as various races of chinook salmon, striped bass, and American shad. Impacts needs to be reevaluated and adequate measures should be developed and included in the Final EIR/EIS. The preparer of the EIR/EIS (Jones and Stokes) needs to take into serious consideration that the SWRCB has a trustee and legal duty to protect the public trust resources of the Bay Delta Estuary when the Board considers approving or not approving the proposed DW Project.

DW Project Alternatives

21. Shallow water management of the reservoir islands during non-storage should not be optional as described in this section. It must be mandatory. While DW is not held to any specific acreage or frequency for wetland habitat on the reservoir islands, which they should, the development of the inner levee infrastructure and management of shallow water wetland during periods when the reservoirs are not flooded under partial or full storage operation are part of the proposed DW Project, and should be required by the SWRCB, DFG, USFWS, and USNMFS. (See Chapter 2) D9-21

Water Supply and Water Project Operations

22. This section implies that the DW Project operation will likely influence upstream storage if either the SWP or the CVP buy DW water and export it rather than make reservoir releases. This section implies a close coordination with the state and federal projects and would result in consultation with the USFWS and USNMFS (FESA).

Issues in the Final EIR/EIS that should be disclosed in more detail include how rediversion by the propsed DW Project will affect the water right permits for the SWP and CVP, and compliance with 1995 WQCP. (See Chapter 3A) D9-22

The question concerning who has water rights to suplus water in the Bay Delta to meet new water quality standards and for the purposes of expoerting water should be disclosed in the Final EIR/EIS. It should be noted that DW is simply a junior water rights applicant for surplus water while the DWR and the USBR hold senior rights over the junior DW water right application. This issue should be discussed and included in the Final EIR/EIS.

Hydrodynamics

23. An analysis was not included in the Draft EIR/EIS with the three (3) agricultural barriers in place to interpret the hydrodynamic simulations with the DW Project. The Final EIR/EIS should include a model simulation with the three (3) agricultural barriers in place. (See Page 3B-8) D9-23

24. How can water banking or water transfers be carried out without close coordination with the SWP and CVP export facilities, and without the approval of the DWR and the USBR? (See Page 3B-1) D9-24

This issue should be disclosed and included in the Final EIR/EIS.

25. Local hydrodynamic effects has the potential to have significant impacts to important shallow shoal and SRA habitat. The Final EIR/EIS should include compensation areas to offset those losses. (See Pages 3B-17 and 18; Impacts B-1 and 2) D9-25

Fishery Resources - Factors Affecting Abundance

26. Very little evidence is provided in the Draft EIR/EIS which implicates discharge of toxic materials as a primary factor influencing young bass abundance in the Delta. The Final EIR/EIS should include site-specific toxic material discharges areas and specific dischargers, and the related impacts to striped bass populations (all life stages) from toxic discharges into the waters of the Bay Delta. (See Page 3F-5) D9-26

27. The Draft EIR/EIS states that the Delta SOS simulations cannot encompass all operation permutations that could occur such as operational decisions at the discretion of DW, DWR, USBR, or the Board. The Board (Edward Anton, Chief, Division of Water Rights) on a consistent basis has approved water transfers simply with the approval of the DFG regardless of the potential direct, indirect, and cumulative impacts to public trust resources because written detailed environmental assessments were not prepared by the Board's staff, DWR or the DFG for water transfers. Also, site specific environmental monitoring programs were not included with the Board's approval of water transfers. Without monitoring, there is no assurance of compliance of terms and conditions in the water transfers approved by the Board's staff. D9-27

It is not clear what operational decisions are at the Board's discretion nor is it clear how the magnitude of the potential direct, indirect, and cumulative effects on public trust resources as a result of the proposed DW Project can be accurately assessed considering this operational uncertainty in the Draft EIR/EIS. The Final EIR/EIS should disclose, evaluate, and mitigate those potential adverse direct, indirect, and cumulative impacts to public trust resources relating to operational criteria for the DW Project concerning storing and diverting water transfer water, water bank water, and also storing and diverting surplus water. (See Page 3F-10 - Second Paragraph Right Column)

Sacramento River - Chinook Salmon - DW Project Discharges

28. Reduced Sacramento River flows should be disclosed in the Draft EIR/EIS and included in the list of major concerns about chinook salmon when DW discharges are diverted during April-June. (See Page 3F-20) D9-28

The effect of reduced Sacramento River flow on chinook salmon mortality index due to export of DW discharges should be disclosed in the Final EIR/EIS. (See Page 3F-20; Column 2, Paragraph 2) D9-28 cont'd

Optimal Salinity Habitat - Again

29. The salinity habitat changes in the Draft EIR/EIS is decribed as being small, but fails to take into consideration the risk of additional entrainment of public trust resources. Much of the habitat for Delta smelt and striped bass is in the vicinity of the pumps, and now additional cumulative sources are being added by the DW Project, expanding the risk to public trust resources because of the DW Project. The Final EIR/EIS should reevaluate salinity habitat and the resulting changes and associated direct and cumulative impacts to public trust resources as a result of the DW Project. (See Page 3F-21) D9-29

Potential Species Specific Effects - Striped Bass Transport

30. It is our understanding it is inaccurate to infer striped bass eggs and larve in the San Joaquin River are less than likely to be entrained since very little of the San Joaquin River is downstream of the central Delta. Any problems with entrainment of eggs and larve in the central Delta would also exist for these life stages produced in the lower San Joaquin River, because they would be transported to the central Delta. The Final EIR/EIR should disclose and clarify this issue. (See 3F-21 at Paragraph 3). D9-30

Indirect and Cumulative Impacts to Sacramento River Flow

31. The indirect impacts described in the Draft EIR/EIS should be amended to disclose the potential cumulative impacts that would result from reduced Sacramento River flows that would likely occur if water is held behind upstream dams when DW water is released for export. (See Page 3F-21 at Paragraph 4) D9-31

American Shad Entrainment

32. There is significant entrainment of American shad at the SWP and CVP pumps from August-October also. Many American shad do not enter the central Delta as supported by the millions salvaged at the CVP and SWP. (See Page 3F-22 at Column 1) D9-32

The Final EIR/EIS should provide mitigation measures which prevents additional cumulative losses to American shad as a result of the DW Project using the state and federal pumps.

Delta Smelt Impacts

33. The assumptions and calculations in the Draft EIR/EIS that conclude that there is a net increase in optimal salinity for Delta smelt are not consistent with the results of the X-2 shift displayed in Table 5-5 of Appendix F-2. The extent of decreases in Delta outflow are likely to result in significant reductions in optimal salinity habitat. (See Page 3F-23 at Paragraph 1)

D9-33

It strongly appears that DW Project operations has the potential to cause adverse impacts to Delta smelt when outflow and habitat for Delta smelt will decrease due to reduced upstream reservoir releases when DW Project discharges are being exported and when DW Project is diverting water.

Amend the Draft EIR/EIS to show that Delta smelt will be impacted as a result of decreases in Delta outflow and decreases in optimal salinity habitat resulting from the DW Project.

Longfin Smelt Impacts

34. The remaining longfin smelt spawn primarily in the Sacramento River. In high outflow years, entrainment is not a problem. However, during low flow years when longfin smelt spawn higher in the system and DW pumping during February (peak larval abundance) will result in a new source of entrainment. (See Page F-23)

D9-34

The 5.6% increase in entrainment of public trust fishery resources is not acceptable. Winter diversions, especially January-March act as an adverse impact. During low outflow years, longfin smelt spawning habitat shifts into the Delta and upstream, resulting in adverse increased salvage/entrainment of migrating adults and subsequent pelagic larvac which then have to pass through the Delta or use it as rearing habitat. Increasing exports during the January to March period in a series of dry or critical dry years have the potential to reduce longfin smelt abundance to a level they might not recover from as a result of the DW Project.

Sacramento Splittail Impacts

35. The DW Project operations has the potential to adversely impact splittail spawning habitat upstream to the extent that reservoir releases are reduced when DW discharges are being exported. (See Page 3F-23 at Column 2)

D9-35

The Final EIR/EIS should disclose, evaluate, and mitigate cumulative impacts to splittail spawning habitat

when upstream reservoir releases are reduced when the DW Project is exporting water.

The Final EIR/EIS should disclose and evaluate the cumulative impacts to longfin smelt during low water years when the DW Project will be pumping during February, and when the DW Project will be exporting water during dry and critically dry years, and during the January to March period. D9-35 cont'd

De Facto Threatened or Endangered Spring-Run Chinook Salmon of the Sacramento River Watershed

36. The Draft EIR/EIS concludes that Sacramento River races of chinook salmon will not be significantly impacted by the DW Project. (See Page 3F-24; Impacts F-4)

The spring-run chinook salmon resources of the San Joaquin River have been extinguished by dams on tributaries to the San Joaquin River, including the USBR Friant Dam on the main stem. Population levels of spring-run chinook salmon in the Sacramento River watershed have declined significantly. The Final EIR/EIS should disclose the status of the spring-run chinook salmon in both the san Joaquin River watershed and in the sacramento River watershed.

The spring-run chinook salmon of the Sacramento River watershed is now being considered for state listing (CESA) and is vulnerable to a similar extent than winter-run chinook salmon. The California Fish and game Commission is expected to receive the DFG recommendation on whether to list spring-run under the protection of the CESA at its January meeting. In the event the spring-run is accepted as a candidate by the Commission, a year long formal review period will begin. During that year, spring-run chinook salmon will receive protection pursuant to CESA. We believe the SWRCB should not act on the Draft EIR/EIS and hold any hearing on DW water right application until a recovery plan for spring-run is prepared and implemented by DFG because new information may be available, including new mitigation and protection measures. D9-36

The jeopardy risk of DW Project diversions for storage to Sacramento River fish whether they are winter-run, spring-run, Delta smelt, or striped bass goes beyond those that are entrained into the Delta Cross Channel or Georgiana Slough.

Impacts to all races of Sacramento River chinook salmon are significant and any reduction to these races of salmon (all life stages) and its habitat is not acceptable. The Final EIR/EIS should treat the spring-run either as threatened or endangered for the purpose of disclosing, evaluating, and mitigating potential significant impacts in the Final EIR/EIS.

DW Project Environmental Resources Fund

37. DW Properties offer to contribute $2 for each acre-feet of water sold for Delta export to fund ecological research in the Bay Delta Estuary. No monies from the fund will be allocated to fulfill project permit requirements. The fund would be administered by DW and an invited committee established to decide how research would be allocated. The committee will likely include representatives from the DFG, USFWS, USNMFS, SWRCB, DW, fishery-oriented and water fowl oriented organizations, and one general environmental organization.

The concept of the fund and the committee is a very good idea, however it may promote the exporting of water from the Bay Delta. The Draft EIR/EIS did not disclose the value of water per acre-foot that DW will sell and/or transfer from the reservoir islands. Based on Governor Wilson's Water Bank Program water transferred over the past few years had a value between $50 to $125 per acre-foot. In future years, the value of water should increase. DW Project under alternative 1 and 2 have the potential to store annually 238,000 acre-feet of water. Consequently the value of DW stored water at the reservoir islands at full capacity is between $11,900,000 to $29,750,000. D9-37

We understand that DW has made this offer, and that it is not a requirement. However, we believe it would be reasonable for DW to offer 7 and 1/2% of the gross selling price of water stored and diverted at the reservoir islands for all project purposes, and not simply the exporting of water.

Water Rights Hearing For the Proposed Delta Wetlands Project

We propose to ask questions in the form of cross examination concerning all of the above metioned CSPA comments at the proposed water rights hearing at the water rights hearing for the DW application. We are requesting that the above mentioned comments are included as key issue at the hearing.

That concludes the comments of the CSPA. Please comment of the above mentioned CSPA comments and include the response in the Final EIR/EIS. Please forward a copy of the Final EIR/EIS to this writer.

Respectfully Submitted

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Interested Parties

California Sportfishing Protection Alliance

D9-1. As described in the 1995 DEIR/EIS, all existing and any future Delta water quality standards adopted by the SWRCB or other regulatory agencies would be applicable to the proposed diversions. Project operations for water storage would not be allowed to violate applicable Delta water quality objectives and public trust values or interfere with the ability of other projects to meet the objectives. In the impact assessment of Delta Wetlands Project effects, it was assumed that the project would be required to operate under all applicable standards for protection of Delta water quality, fish and wildlife uses, and other resources; it was also assumed that the project would be precluded from interfering with the ability of those holding prior water rights to comply with Delta standards. The analysis of project effects presented in the 2000 REIR/EIS used a new simulated baseline condition. The new baseline incorporates Delta operating criteria and standards established as a result of state and federal programs implemented since publication of the 1995 DEIR/EIS.

D9-2. See response to Comment D9-1.

D9-3. See Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow", for a discussion regarding use of the Delta Wetlands Project for water transfers and water banking.

D9-4. The Delta Wetlands Project would not interfere with entitlements by senior water rights holders, including counties along the Sacramento or San Joaquin Rivers, as stated on page 2-7 of the 1995 DEIR/EIS (page 2-9 of Volume 1 of this FEIS) under "Timing and Rate of Diversions onto the Reservoir Islands". Assumptions about operations of the Delta Wetlands Project in relation to diversions by senior water right holders and to operations of the SWP and CVP are detailed on pages 3A-10 through 3A-12 of the 1995 DEIR/EIS (pages 3A-12 through 3A-14 of FEIS Volume 1). As described in Chapter 2 under "Coordination with Water Rights, Delta Standards, and Fish Take Limits" permits granted by the SWRCB would require that project diversions not interfere with the diversion and use of water by other users with riparian or prior (senior) appropriative rights. See also response to Comment B7-1.

D9-5. See Master Response 3, "Areas of End Use and Potential Growth-Inducement Effects of Delta Wetlands Water Deliveries".

D9-6. The commenter is correct in noting that water transfers and water banking currently occur without the Delta Wetlands Project. The project description states that the purpose of the project is to "divert surplus Delta inflows, transferred water, or banked water for later sale and/or release for Delta export or to meet water quality or flow requirements for the Bay-Delta estuary". The analysis of effects of the Delta Wetlands Project focuses on the use of the project as a stand-alone water storage facility for storing surplus inflows to meet the existing and anticipated future demand for water supply. See also Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow".

D9-7. See response to Comment D2-2.

D9-8. Delta Wetlands Project operations would not affect upstream reservoir releases. The project would need to be integrated with SWP and CVP operations for this to occur. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program". It should be noted that the CVP and SWP must meet the upstream temperature criteria under SWRCB Order 90-5 and the biological opinion for SWP and CVP effects on winter-run chinook salmon. If the SWP or CVP purchase Delta Wetlands water as a replacement for upstream reservoir releases, the SWP and CVP would still need to meet existing instream flow and temperature requirements.

D9-9. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

D9-10. Since this comment letter was submitted, the lead agencies have concluded formal consultation with DFG, NMFS, and USFWS on the effects of the Delta Wetlands Project on listed fish species. As part of the consultation process for compliance with the federal and California ESAs, USACE, the SWRCB, NMFS, USFWS, DFG, and Delta Wetlands agreed on the project operating parameters referred to as the FOC, which have been incorporated into the proposed project. DFG subsequently issued a no-jeopardy biological opinion for project effects on delta smelt and winter-run chinook salmon; NMFS issued no-jeopardy biological opinions regarding project effects on winter-run chinook salmon, Central Valley steelhead ESU, and Central Valley spring-run chinook salmon and their habitats; and USFWS issued no-jeopardy biological opinions regarding project effects on delta smelt and splittail and their habitats. The biological opinions include RPMs to reduce or compensate for the incidental take of listed species. The FOC and RPMs reduce all potential project impacts on these species to a less-than-significant level and provide protections for nonlisted species. If the lead agencies approve Delta Wetlands' permit applications, Delta Wetlands will be required to implement the terms of the biological opinions as part of its operating conditions. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for details about the formal consultation and discussion of the terms of the biological opinions.

D9-11. The relationship between optimal salinity habitat and fish abundance is difficult to evaluate; however, project impacts on optimal salinity habitat were evaluated in the 1995 DEIR/EIS based on a methodology that recognized a significant relationship between indices of fish abundance and availability of optimal salinity habitat. DFG, NMFS, and USFWS addressed concerns about optimal salinity habitat by including in the FOC several terms that directly limit the change in the location of X2 that Delta Wetlands diversions would be allowed to cause. These terms are described generally in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", and are detailed in response to Comment A7-3.

D9-12. See response to Comments B7-64 regarding predation at Delta Wetlands facilities. All siphons and pumps used under Delta Wetlands Project operations would have fish screens. See response to Comment B6-60 regarding the design for fish screens.

D9-13. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities", which describes the potential effects of boat use on aquatic habitat and mitigation to reduce and compensate for those effects. See also response to Comment B6-11 regarding project effects on channel islands on the northeastern side of Franks Tract and in Santa Fe Cut.

D9-14. The biological opinions include terms that limit the effects of Delta Wetlands discharges on DO levels. See "Project Effects on Dissolved Oxygen Levels" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

D9-15. As described in response to Comment B6-18 from DFG, the activities of current and former landowners of the Delta Wetlands Project islands conducted under the Delta Flood Protection Act (SB 34) program are not part of the proposed project or project alternatives. These activities, regulated by DWR, are subject to separate environmental review and mitigation requirements. For the Delta Wetlands Project, the following project elements identified in the California and federal ESA biological opinions would minimize and avoid, where feasible, effects on habitat and would replace lost habitat:

- Conserve in perpetuity 200 acres of shallow-water rearing and spawning habitat.
- Contribute $100 per year per additional boat berth for boat-wake-erosion mitigation.
- Mitigate on a 3:1 basis for aquatic habitat lost to construction activities.
- Limit in-water construction to June through November.
- Avoid areas of immersed and submersed plants while riprap is placed and diversion and discharge structures are built.

D9-16. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

D9-17. See Master Response 3, "Areas of End Use and Potential Growth-Inducement Effects of Delta Wetlands Water Deliveries".

D9-18. The No-Project Alternative analyzed in the 1995 DEIR/EIS and the 2000 REIR/EIS meets the requirements of CEQA and NEPA. Section 15126.6(e)(3) of the State CEQA Guidelines states that the no-project alternative "is the circumstance under which the project does not proceed. If disapproval of the project under consideration would result in predictable actions . . . this 'no project' consequence should be discussed". The

commenter refers to several potential sources of future water supply to the Delta. However, the quantity and timing of these inflows are not predictable, and modeling of such future increases would be too speculative for impact analysis purposes. Also, the effects of Delta Wetlands diversions on water quality (i.e., salinity) and fish may be understated if higher inflows are assumed as a basis for the impact assessment.

Furthermore, it cannot be assumed that future increases in inflows to the Delta would meet the demands for water storage and transfers, making the Delta Wetlands Project obsolete. As documented in the 2000 REIR/EIS, Delta Wetlands Project operations were analyzed using a 1995 level of demand for water. The analysis showed that south-of-Delta delivery deficits exist in most years under this assumed level of demand. However, demand for water has already increased above this level, and future demands can be expected to be greater as well. For example, in the last year, the CVPIA b(2) rules have been interpreted much more strictly than before; as a result, projected effects on CVP agricultural contractors (i.e., delivery deficits) are greater than they were a few years ago. In addition, the CVP must obtain and wheel "Level 4" water supplies of about 200 TAF to wildlife refuges. Also, the CALFED EWA represents a new, additional purchaser of stored water. The Metropolitan Water District has begun filling the Diamond Valley Reservoir, which was not included in the baseline. These changes all reflect greater demand for water than the demand assumed for the 2000 REIR/EIS simulations of Delta Wetlands Project operations. As the population of the state increases, overall demands for water will increase to a 2020 level of demand, and the unmet demand for beneficial uses of water in the San Joaquin Valley and Southern California will also increase.

D9-19. Implementing the Delta Wetlands Project would not reduce public access or opportunities for recreation on the project islands. See response to Comment B6-21 regarding the provision of public recreation on the Delta Wetlands Project islands.

See responses to Comments B6-33 and B6-42 regarding project effects on striped bass. See also "Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows, Downstream Transport, Area of Optimal Salinity Habitat, and Entrainment" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

D9-20. As stated in response to Comment B6-9, the following definition was applied to significance of direct impacts in the 1995 DEIR/EIS (see page 3F-13 of the 1995 DEIR/EIS [page 3F-15 of Volume 1 of this FEIS]): "[I]mpacts were considered significant if it was determined that conditions contributing to existing stress would be worsened by Delta Wetlands Project operations and facilities, resulting in a substantial reduction in population abundance and distribution". As further noted, the definition of a "substantial" reduction varies with each species; it depends on the ability of the population to maintain or exceed current production levels through mechanisms that compensate for reduced abundance of earlier life stages. Impacts were considered cumulatively significant if project operations and facilities would contribute to existing or future stress that causes or would cause a

substantial reduction in population abundance and distribution. The definitions of significance used in the EIR/EIS are consistent with CEQA and NEPA.

All potential effects of project operations on aquatic species are addressed by the FOC and RPMs described in the biological opinions. These measures include restrictions on project diversion and discharge operations, measures to compensate for project effects on habitat, and a comprehensive monitoring program. The measures described in the biological opinions replace the mitigation measures presented in the 1995 DEIR/EIS for the proposed project.

See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for more information about the results of the formal consultation and about terms of the biological opinions.

D9-21. See responses to Comments B6-7 and B6-24.

D9-22. It is not known at this time how Delta Wetlands Project operations, if coordinated with or integrated into the operations of upstream reservoirs, could substitute for upstream flow releases to meet Bay-Delta outflow requirements. The NEPA and CEQA analysis does not speculate on the variety of ways that the project could be incorporated into other water operations. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program", regarding this issue.

As described in Chapter 2 under "Coordination with Water Rights, Delta Standards, and Fish Take Limits", permits granted by the SWRCB require that project diversions not interfere with the diversion and use of water by other users with riparian or prior (senior) appropriative rights. Additionally, as described in Chapter 2 of the 2000 REIR/EIS and of FEIS Volume 1, Delta Wetlands has entered into stipulated agreements with several parties, including DWR and USBR, that reaffirm the seniority of these parties' water rights and ensure that project operations would not interfere with the ability of those parties to exercise their rights.

D9-23. See response to Comment B6-28.

D9-24. See Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow", for a discussion regarding use of the Delta Wetlands Project for water transfers and water banking.

D9-25. See responses to Comments B6-11 and B6-31 regarding effects of Delta Wetlands Project discharges on local channel conditions.

D9-26. The passage on page 3F-5 of the 1995 DEIR/EIS referred to by the commenter (see page 3F-6 of Chapter 3F of FEIS Volume 1) lists several environmental conditions that are assumed to affect year-class abundance of striped bass. The potential factors listed are the

location of X2; entrainment of eggs, larvae, and juveniles in Delta diversions; and discharge of toxic materials *into rivers tributary to the Delta*. Delta Wetlands operations would not affect discharges of toxic materials into rivers tributary to the Delta; therefore, this factor was not discussed further. Adding this information would not change the analysis of project effects on striped bass; therefore, no information needs to be added to the analysis.

D9-27. The best available tools were used to predict Delta Wetlands Project operations under a range of hydrologic conditions and within the objectives of the 1995 WQCP. Direct, indirect, and cumulative impacts of the project have been fully disclosed. See response to Comment B6-34.

Operation of the Delta Wetlands Project involving transferred or banked water would likely require additional approvals from the SWRCB and additional environmental documentation; SWRCB approval of Delta Wetlands' water right permits does not constitute approval of use of the project islands for transfers or water banking. For more information about this subject, see Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow".

The FOC terms include a comprehensive monitoring program that is summarized in Master Response 4. For more detail, see the attachment to the FOC entitled "Delta Wetlands Fish Monitoring Program" in Appendix B of the 2000 REIR/EIS.

D9-28. Delta Wetlands Project operations, as described in the 1995 DEIR/EIS, would not affect flows in the Sacramento River. See response to Comment B6-40 and Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for a description of the biological opinion measures incorporated into the project description that reduce potential project impacts on winter-run and spring-run chinook salmon to a less-than-significant level.

D9-29. The risk of additional entrainment attributable to changes in salinity habitat is integrated in the analysis of transport effects (Impacts F-5 and F-7 in the 1995 DEIR/EIS [see page 3F-28 in Volume 1 of this FEIS]. The methodology is explained in Appendix F2 of the 1995 DEIR/EIS. See response to Comment A7-3 regarding FOC measures that limit project effects on optimal salinity habitat by limiting effects on X2.

D9-30. Entrainment of striped bass was evaluated based on the historical distribution. A significant impact was identified (Impact F-5) and mitigation was proposed. See response to Comment B6-33.

D9-31. Delta Wetlands Project operations, as described in the 1995 DEIR/EIS, would not affect Sacramento River flows or the operations of upstream reservoirs. See Master Response 2,

"Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

D9-32. See response to Comment B6-43.

D9-33. See response to Comment B6-44. See also Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program", for a discussion of the relationship between project operations and upstream reservoir releases.

D9-34. See response to Comment B6-45.

D9-35. The commenter is concerned that Delta Wetlands Project operations could adversely affect splittail spawning habitat upstream to the extent that reservoir releases are reduced when project discharges are being exported, and requests that the NEPA and CEQA analysis evaluate cumulative impacts on upstream habitat for splittail. Delta Wetlands Project operations, as described in the 1995 DEIR/EIS, would not affect the operations of upstream reservoirs. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

The commenter also requests that the NEPA and CEQA analysis evaluate cumulative impacts on longfin smelt during years of low flows. The commenter's concerns about project effects on longfin smelt have been addressed by the FOC measures to protect listed species. See response to Comment A5-6 and Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

D9-36. See response to Comment B6-47 regarding the relationship between Delta Wetlands Project operations and impacts on Sacramento and San Joaquin River juvenile salmon. See response to Comment B6-8 regarding protections for spring-run chinook salmon provided by the FOC and terms of the NMFS and DFG biological opinions.

D9-37. Delta Wetlands' contribution of $2 per acre-foot of exported water toward a research fund is not expected to affect project operations or the amount of water exported. Delta Wetlands' contribution to an environmental research fund is not required by the lead agencies as mitigation; therefore, compliance with the request that Delta Wetlands contribute a greater amount per acre-foot of water is at Delta Wetlands' discretion.

Letter D10

California Native Plant Society

1755 4th Ave.
Sacramento, CA 95818
December 19, 1995

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1325 J Street, Room 1444
Sacramento, CA 95814-2922

Dear Mr. Monroe:

Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project

The Sacramento Valley Chapter of the California Native Plant Society is pleased to provide input on the Draft EIR/EIS for the Delta Wetlands Project. We have limited the scope of our comments to botanical issues.

1. Chapter 3G. *Affected Environmental Consequences - Vegetation and Wetlands*. This chapter states that if special status plants are inadvertently affected, then DW shall contact DFG and negotiate appropriate mitigation. We recommend that the mitigation measures be provided for our review. The mitigation measures should have criteria to assess the success of the mitigation and remedial measures should mitigation fail. **D10-1**

2. Appendix G2. *Prediction of Vegetation on the Delta Wetlands Reservoir Islands*. We highly recommend that a revegetation plan be developed that contains the information needed to implement the creation of the mitigation habitats. The revegetation plan should contain, at a minimum, the following information.

   a. Baseline information on the cover, density, and species richness of the desired habitat types should be provided. This information can be obtained from nearby, off-site reference areas if baseline information cannot be obtained on site and will form the basis of developed performance standards. **D10-2**

   b. The species, seeding rates, and methodology should be described. Any species chosen for an erosion control mix

should be native and not be invasive in the created wetland areas. Similarly, plants that will be installed as rooted or unrooted material should be listed to the species level.

c. The source(s) of plant material are not listed. Harvesting of off-site wetland vegetation for use in site revegetation can result in the degradation of the off-site wetland.

d. The potential for and/or existing problems with invasive exotic species and their eradication should be discussed.

D10-2 cont'd

e. Specific planting densities and the spatial arrangement for emergent and riparian species should be provided.

f. The revegetation plan should include performance standards for density, species richness, erosion control, and weed abatement. Performance standards proposed for the recreated emergent marsh and riparian habitats are lacking in specificity.

g. The revegetation plan should describe the specific remedial measures to be implemented if revegetation is not successful according to performance criteria.

h. Broadcasting seed of cottonwood and willow is not recommended. These species propagate best by stem cuttings.

Thank you for the opportunity to review this well prepared document.

Sincerely,

Karen Wiese

Karen Wiese, Member
Sacramento Valley Chapter

cc: Eva Butler, President, Sacramento Valley Chapter

George Clark, Statewide President, CNPS

Mona Robison, Conservation Chair, Sacramento Valley Chapter

California Native Plant Society

D10-1. Mitigation of project impacts on special-status plant species is described on page 3G-12 of Volume 1 of this FEIS. Chapter 3G of the 1995 DEIR/EIS has been changed to broaden mitigation requirements for impacts on special-status plant species. The last paragraph under "Mitigation Measure G-2: Protect Special-Status Plant Populations from Construction and Recreational Activities" (see page 3G-13 of FEIS Volume 1) has been revised as follows:

> Areas that support special-status plant populations shall not be open to recreation. If special-status plant populations are inadvertently affected by construction or recreational uses, Delta Wetlands shall contact DFG and negotiate appropriate mitigation to offset impacts, <u>including development of a mitigation monitoring program and performance standards</u>.

The performance standards would be used to assess the success of the mitigation, and the mitigation monitoring program will provide remedial measures that would be taken should mitigation fail to meet the performance standards. CNPS can request a copy of any such mitigation developed for special-status plant species from DFG.

D10-2. Appendix G2 describes predicted vegetation conditions on the Delta Wetlands reservoir islands under storage, nonstorage, and shallow-water wetland project conditions. Although the reservoir islands may be seeded with waterfowl food plants at Delta Wetlands' discretion during nonstorage periods (page G2-4, third paragraph), revegetation of the reservoir islands is not required for mitigation of project impacts. The HMP (Appendix G3) describes a process for developing planting specifications to establish vegetation on the habitat islands (see page 13 of the HMP). Detailed construction specifications and plan drawings, which would include planting plans, would be developed by Delta Wetlands and reviewed by DFG to ensure that compensation habitats are established as described in the HMP.

Letter D11

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December 20, 1995

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Attention: Jim Monroe
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Sacramento, CA 95814-2922

RE: COMMENTS ON THE DELTA WETLANDS PROJECT DRAFT EIS/EIR

Dear Sirs:

The Natural Heritage Institute has the following comments on the Delta Wetlands (DW) Project DEIS/EIR (September 1995).

NHI would like to support the DW Project if possible. The Project has the potential to enhance the environment and ease competition for water while improving the long term survivability of several Delta islands. Unfortunately, NHI cannot support the Project as described in the DEIR/S because it will have negative impacts on the aquatic environment, in contradiction to the spirit of the December Accord. However, we believe that modifications to the project description are possible which would allow NHI to move to a position of support.

NHI supports the conversion of two Delta islands into water storage facilities as proposed by DW if:

- The terrestrial environment receives net improvements as part of the package.
- The aquatic environment receives net improvements as part of the package.[1]

Our conclusions are that:

[1] Given our limited resources, we did not analyze the extent to which the Delta Wetlands Project would provide net improvements to the terrestrial environment. Instead, NHI analyzed the impact of the Project upon the aquatic environment.

1. The operational rules proposed for the project are based upon a fundamental misreading of the meaning of the December 15 Accord and the SWRCB 1995 WQCP for the Delta.
2. The Project, as defined in the DEIR/S will cause significant negative impacts to the aquatic environment.
3. The DEIR/S not only ignores the cumulative impacts of future efforts to capture high flows to increase water supplies, but ignores the impacts of water project operations closely linked to the Project.
4. These three problems could be resolved by a new set of operating rules.

Taking these in order:

1. *The operational rules proposed for the project are based upon a fundamental misreading of the meaning of the December 15 Accord and the SWRCB 1995 WQCP for the Delta.*

The December 15, 1994 Accord represented a paradigm shift in attitudes toward protection of the Bay-Delta system environment Before the Accord, project proponents could treat environmental protection as a simple constraint on project operations. That is, regulatory agencies would set standards (e.g., D 1485) and agencies could then manage water in whatever way they wanted, provided that they did not violate the standards. The result of that older paradigm has been disastrous. Water users became quite adept at extracting more and more water from the system while still maintaining standards. Thus, under D 1485, water exports increased and environmental quality declined dramatically, all without major violations of the standards. D11-1

However, the December 15 Agreement was based, not upon minimum standards, but upon the interaction between a set of standards and normal operations by the State and Federal project. No one asserted that the X2 and export limitations were intrinsically protective, only that with California's hydrology and projected state and federal operations, the Delta would receive adequate interim protection. In other words, water flows above those needed to meet the minimum X2 requirements and export pumping below the permitted percentage limits were expected and counted on by the CALFED agencies to provide part of the baseline protections. Additional actions which would change the interaction between operations and environmental protection -- such as South Delta Facilities, water transfers, and DW -- were not part of the Accord and are not covered by the operational rules in the Accord.[2]

Moreover, the December 15 Accord and the SWRCB actions which followed are based upon the notion that the aquatic environment in the Delta needs to be stabilized at an acceptable level to assure that long term Delta planning can occur without the stress caused by continued biological declines. This implies that no additional action should take place in the Delta while the long-term planning process is underway unless that action is, at worst, neutral with respect to the aquatic environment or (more appropriately) provides net environmental benefits.

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[2] For example, in determining whether the new standards complied with the Federal endangered species act, the National Marine Fisheries Service (NMFS) and the US Fish and Wildlife Service (USFWS) analyzed, not the standards, but the actual flow patterns (such as QWEST and percentage of Delta inflow exported) projected to occur under the new standards.

The DW DEIR/EIS takes the position that diversions onto the islands would be undertaken whenever extra exports would be allowed under the SWRCB 1995 WQCP and that discharge from the islands could take place for export as long as SWRCB export standards are met (in one option, the project suggests that water from the project for export would not be subject to the percentage entrainment requirement). D11-1 cont'd

As discussed above, the SWRCB WQCP standards are inappropriate for the DW Project. Instead of assuming the applicability of SWRCB WQCP standards, the Project should define and analyze operational rules which do not intrude upon baseline protections and, preferably, provide net environmental benefits.

2. *The Project, as defined in the DEIR/S will cause significant negative impacts to the aquatic environment.*

My comments on impacts have to do with the broad environmental impacts associated with the diversion of water (and the upstream movement of X2) and possible increases in the overall percentage of Delta inflow which is diverted.

The DEIR/EIS acknowledges that the upstream movement of X2 and increases in the percentage of Delta inflow exported will cause negative environmental impacts. However, the DEIR/EIS argues that these impacts can be mitigated to a less than significant level. This analysis is inadequate for several reasons:

- As discussed above, it is not sufficient that DW reduce impacts to less than significant levels. Rather, DW operations must fully compensate for all project impacts and should, in fact, provide positive net benefits to the environment. Otherwise, DW would violate the spirit of the December 15 Accord. D11-2
- Even ignoring the need for full mitigation, the criteria selected for "significant impacts" are arbitrary and ignore X2/species-health data.

As discussed above, the rules which define DW operations should not be connected to the standards set by the SWRCB for the state and federal projects. Therefore, the standard of significance used in the DEIR/EIS which defines as significant any operation which pushes conditions to within 10% of a SWRCB standard is inappropriate. DW operations must be evaluated based upon their own particular impacts, not according to compliance with the SWRCB WQCP standards.

The other standard of significance in the DEIR/EIS is whether a particular parameter changes by more than 20%. This definition of significance is both lenient and arbitrary. Under this definition, major shifts in salinity intrusion can occur without being considered significant in the DEIR/S. The DEIR/S should analyze the sensitivity of the analysis to other measures of significance. For example, if the significance threshold were set at a 5% change in parameters, what would happen to the yield of the project and the impacts of the project?

A related measure, area of suitable habitat, is considered in the fisheries chapter, but then never applied on the grounds that changes in X2 are too small to make any difference. But in any case, there is no scientific evidence on the impact of changing the area of suitable habitat on D11-3

fisheries. On the other hand, very strong correlations have now been developed between the average value of X2 over particular time periods and indices correlated with the populations for a number of species. Unfortunately, these indicators of significance were not considered in the document. These correlations were the foundation upon which the X2 standards in the SWRCB WQCP were built. Of course, correlations do not mean causation. Nevertheless, these correlations are the best tools we have for predicting biological outcomes. To the extent that DW operations moves X2 upstream, these correlations suggest that the various population indices will move downward. This effect can be easily quantified and mitigation measures designed to compensate for lost productivity could be developed (see below). **D11-3 cont'd**

Thus, with respect of changes in X2 and the impact of those changes on the environment, the document EIR/S should:

- o Perform a sensitivity analysis to show how reducing the arbitrary 20% significance threshold changes project operations.
- o Assess environmental impacts according to the correlations between X2 and environmental health.
- o Develop operational measures to provide full compensation to the environment for changes in X2. Of course, once these measures have been developed and incorporated into the operational rules, the "significance" threshold becomes less relevant.

DW relies on the same rationale when it comes to entrainment impacts. That is, DW commits not to violate the SWRCB WQCP and commits to reduce (but not eliminate) the entrainment caused by operations through a number of measures. As the DEIR/S indicates, DW operations will increase the percentage of inflows diverted and the entrainment of biota above those assumed in the December Accord. As discussed above, this mode of operation is contrary to the December 15 Accord. **D11-4**

Moreover, as in the case of the X2 discussed above, the determination of significant levels of entrainment is arbitrary. I would assert that, even with the mitigation measures proposed, that entrainment caused by DW remains significant.

Again, rather than argue about what is or is not significant, DW should develop a mechanism to assure full mitigation for entrainment impacts. Some ideas on how this might be accomplished are discussed below.

3. *The DEIR not only ignores the cumulative impacts of future efforts to capture high flows to increase water supplies, but ignores the impacts of water project operations closely linked to the Project.* **D11-5**

The profitability of the DW Project depends upon finding buyers for the water developed under the agreement. While the water could be purchased for environmental outflow, by far the most likely destination for this water is the export areas -- probably southern California. In order to move this water to the export facilities, DW will discharge stored water back into the Delta channels with concomitant increases in export pumping.

It is difficult to believe that increased export pumping will not increase overall entrainment of fish. This increase may be muted to some degree due to the fact that the DW discharge point is south of the San Joaquin River. Nevertheless, the DEIR/EIS does not analyze the possible increases in entrainment due to the delivery of DW water to the export pumps. This effect is not analyzed as an impact of the Project, nor even as a cumulative impact of the Project -- despite the fact that the profitability of the entire enterprise probably depends upon this increased export pumping! D11-5 cont'd

The DEIR/EIS also does not analyze the possible cumulative impacts from other projects designed to capture high flows for later use. A number of such projects are now being under discussion upstream of the DW Project. Several such projects, operated under rules similar to those proposed for DW could dramatically change Delta flow patterns -- even if the proposed mitigation measures are implemented. D11-6

4. *These three problems could be resolved by a new set of operating rules.*

The problems identified are solvable if the operating rules were designed to provide full compensation to the environment (as opposed to merely limiting damage based upon an arbitrary definition of "significance"). If carefully structured, such rules could retain most of the project yield projected in the DEIR, while encouraging DW to operate in an environmentally sensitive fashion in its own self interest.

The rules could be based upon the following considerations:

X2

- Average X2 is correlated with numerous measures of environmental health. The farther downstream average X2 moves, the higher the indices of health. D11-7
- The movement of X2 downstream is related logarithmical to Delta outflow. At high flows, therefore, reductions in Delta outflow have a small effect on X2. At low Delta outflows, increases in Delta outflow can have a large effect on X2.
- This non linearity of X2 provides the basis for mutually beneficial operations. That is, additional yield can be developed from the system, by extracting water at periods of high flow, then boosting outflows during periods when X2 is farther upstream. Average X2 remains constant, but yield is increased.

The water used to increase Delta outflow during lower flow periods could come from the islands (thereby reducing yield). Alternatively, DW could purchase water upstream to boost environmental flows. The option of purchasing upstream water is probably preferable, since the release of that water would have greater environmental benefits, would not reduce project yield, and might be cheaper per acre-foot than water stored on the islands is worth.

DIVERSIONS ONTO DELTA ISLANDS

The entrainment impacts of diversions onto Delta islands vary according to time of year, ambient conditions (Delta inflow, Delta outflow), species populations, and real time conditions. Some entrainment already occurs as a result of farming operations on the islands.

Rough rules for diversions and full mitigation could be developed using the time of year, ambient physical conditions and real time biological conditions. In general, compensation would be required from DW in rough proportion to the amount of damage done by entrainment greater than the entrainment already occurring on the islands. Compensation could take the form of money (which could be used to screen diversions elsewhere), or flows to increase productivity (as discussed above).

Rediversion for Export

To the extend that DW develops new water for export, fish will experience entrainment impacts twice -- once when the water is diverted onto the islands, once when the water is rediverted into the export pumps. This second diversion must also be fully mitigated. D11-7 cont'd

The amount of additional damage caused by rediversion can be estimated through modelling. Since DW would be discharging water south of the San Joaquin River for delivery to the export pumps, the problem should not be difficult to solve. If DW abandoned a percentage of the water discharged (i.e., the export pumps would only pick up a fraction of the water discharged by DW), then net flows toward the pumps from north of the DW discharges might be reduced despite the increased export pumping (particularly if the discharges take place when the Old River Barrier is in place. If the barrier is not in place, the hydrodynamics would be more complex). Therefore, it should be possible to estimate the amount of carriage water needed to assure that the DW rediversions do not cause additional entrainment problems.

Of course, if DW were ever to build an overland connector to the export pumps, this mitigation would no longer be necessary.

Thus, new operational rules should be possible which fully compensate the aquatic environment for project operations should be possible without major impacts on the profitability of the project. By linking the levels of mitigation to the size of the impacts in real time, DW will be encouraged to operate in an environmentally sensitive fashion in its own interest.

I hope that these comments are helpful.

Sincerely,

David Fullerton
Staff Scientist

cc John Winther Delta Wetlands
Gary Bobker Bay Institute

Natural Heritage Institute

D11-1. The 1995 WQCP objectives were selected as the most appropriate initial operational criteria for evaluating the potential impacts of Delta Wetlands Project operations. See responses to Comments A4-7 and A7-2.

The FOC terms, developed through the federal and California ESA consultation process, place parameters on Delta Wetlands Project operations to ensure that the project would not compromise the protection measures included in the 1995 WQCP and the Water Accord. These terms address potential effects of the project on outflow, X2, and entrainment. The FOC and biological opinion RPMs include other measures, such as conserving in perpetuity 200 acres of shallow-water rearing and spawning habitat and mitigating on a 3:1 basis the loss of aquatic habitat to construction activities. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

D11-2. DFG, NMFS, and USFWS addressed concerns about optimal salinity habitat and project effects on X2 by including in the FOC several terms that directly limit the change in the location of X2 that Delta Wetlands diversions would be allowed to cause. These terms are described generally in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", and are detailed in response to Comment A7-3.

See also Master Response 6, "Significance Criteria Used for the Water Quality Impact Analysis", for further discussion of the significance criteria used in the analysis.

D11-3. The scientific evidence for optimal salinity habitat is the same as the evidence for X2 (see Appendix A to the biological assessment, which is Appendix F2 of the 1995 DEIR/EIS). DFG, NMFS, and USFWS addressed concerns about optimal salinity habitat and project effects on X2 by including in the FOC several terms that directly limit the change in the location of X2 that Delta Wetlands diversions would be allowed to cause. These terms are described generally in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", and are detailed in response to Comment A7-3.

D11-4. See response to Comment B6-9 regarding the definition applied to significance of direct impacts in the 1995 DEIR/EIS. The definitions of significance used in the analysis are consistent with NEPA and CEQA.

The FOC terms, developed through the federal and California ESA consultation process, reduce all potential project impacts on fisheries identified in the 1995 DEIR/EIS to a less-than-significant level. The parameters placed on Delta Wetlands Project operations by the FOC ensure that the project would not compromise the protection measures included in the 1995 WQCP or violate the spirit of the Water Accord. See Master Response 4,

"Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for details about the FOC and RPMs for the Delta Wetlands Project.

D11-5. Exporting water discharged from the Delta Wetlands reservoir islands would increase entrainment of fish at the SWP/CVP facilities. This increase in entrainment was shown in Appendix F2 of the 1995 DEIR/EIS and was acknowledged in the following impacts:

Impact F-4, Potential Increase in the Mortality of Chinook Salmon Resulting from the Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows;

Impact F-5, Reduction in Downstream Transport and Increase in Entrainment Loss of Striped Bass Eggs and Larvae, Delta Smelt Larvae, and Longfin Smelt Larvae; and

Impact F-7, Increase in Entrainment Loss of Juvenile Striped Bass and Delta Smelt.

The FOC and biological opinion RPMs reduce these impacts to a less-than-significant level. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

D11-6. See response to Comment C9-52.

D11-7. The operating rules described in the FOC and incorporated into the proposed project mitigate potential project impacts on fish species and their habitats. The FOC terms include a comprehensive monitoring program and project operating rules that respond to daily conditions. Both the 1995 DEIR/EIS (see Appendix A4) and the 2000 REIR/EIS (see Appendix F) discuss the potential daily Delta Wetlands operations that would be modified as daily Delta flow and salinity conditions change. Appendix F of the 2000 REIR/EIS indicates how the requirements identified in the FOC for the project would limit daily operations. Measures to protect fish include FOC terms that specify several periods of delay for the beginning of Delta Wetlands diversions, including restrictions based on X2 location, and reductions in Delta Wetlands operations when the FMWT index is less than 239. The FOC also include provisions to reduce Delta Wetlands pumping or diversions if protected fish are observed in the required daily fish monitoring. The FOC terms are expected to protect fish from Delta Wetlands Project impacts under all possible daily conditions for Delta flows, salinity, and fish abundance. The RPMs in the state and federal biological opinions add further protections and compensation for incidental take of protected species.

As described in response to Comment D11-5, the 1995 DEIR/EIS reported that the project could increase entrainment of fish at the SWP and CVP facilities.

See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for a summary of the FOC and RPMs.

Letter D12

The Bay Institute of San Francisco

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RE: DRAFT EIR/EIS FOR THE DELTA WETLANDS PROJECT

Dear sirs:

This letter is submitted as the comments of The Bay Institute of San Francisco on the Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS) for the Delta Wetlands Project (Project); water right applications 29061, 29063, 29066, and 30267, 30268, 30269 and 30270 before the State Water Resources Control Board (SWRCB); petitions before the SWRCB to change the applications; and application to the U.S. Army Corps of Engineers (USACE) for a permit pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act in Contra Costa and San Joaquin Counties.

The Bay Institute opposes certification of the Draft EIR/EIS, approval of water rights petitions and amendments by SWRCB, and issuance of permits by USACE, at this time. The Delta Wetlands Project as currently proposed would cause extremely significant adverse impacts to endangered fish species, other aquatic resources, and habitat and water quality conditions in the San Francisco Bay-Delta estuary. These adverse impacts include but are not limited to: D12-1

- o estuarine habitat degradation from the upstream movement of the 2 ppt salinity isohaline (X2) and reduction of Delta outflow in almost all years as a

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result of Project diversions;

o indirect losses of endangered fish species and other resources from disruptions of fish migration, increased entrainment at the state and federal export facilities in all years, increased temperatures, and other results of Project diversions and discharges; and,

o replacement of releases from the upper watershed of the estuary with less biologically significant Project discharges to help achieve Delta outflow requirements.

D12-1 cont'd

We believe that the Project has the potential to offer important water supply and environmental benefits if operated under a set of much more narrowly prescribed terms and conditions, over and above the terms and conditions for existing water projects contained in the 1995 Bay-Delta Water Quality Plan (1995 WQCP). Such terms and conditions would greatly restrict Project operations during the peak spawning and migration periods; concentrate on use of remaining low impact windows for diversion to and discharge from Project storage; and provide for comprehensive mitigation of residual impacts. The alternatives considered in the Draft EIR/EIS do not meet these criteria.

<u>The Project assumes that compliance with current water quality standards will largely offset its non-localized impacts</u>

Project compliance with the X2 requirements and export criteria contained in the 1995 WQCP is not adequate to prevent significant adverse impacts to estuarine habitat and biological resources in the estuary. Modeling by federal and state agencies of the impacts of the 1995 WQCP standards assumed baseline conditions of water project operation for storage and export at existing capacity. Under these baseline conditions, benefits to estuarine habitat and biological resources experienced from downstream movement of X2, increases in Delta outflow and QWEST, and constraints on export frequently exceed the direct requirements of the 1995 WQCP.

D12-2

The Bay Institute and other signatories to the December 15, 1994, Principles for Agreement on Bay-Delta Standards were able to reach agreement on a level of protection for the estuary that assumed X2, outflow, export and QWEST impacts based on the existing level of development. The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) subsequently issued findings of no jeopardy for the Delta smelt and winter-run chinook salmon, both listed under the federal Endangered Species Act, that assumed X2, outflow, export and QWEST impacts based on the existing level of development. Approval by the U.S. Environmental Protection Agency (USEPA) of the 1995 WQCP under its Clean Water Act Authority also assumes these baseline conditions, and calls for reevaluation of the 1995 WQCP criteria if baseline conditions change.

The Project should not proceed unless and until the SWRCB and USACE impose new terms and conditions to ensure that water quality benefits are not lost from X2, outflow, export and QWEST values that exceed the 1995 WQCP's direct criteria but which are expected to occur under the 1995 WQCP's baseline conditions. Some preliminary terms and conditions are suggested below.

Project diversions will adversely affect X2 location and Delta outflow and EC levels

Project operations would cause upstream movement of X2 up to 1.4 km during the critical peak spawning and migration period from February through June, and up to 3.5 km from September through November. Correspondingly, Delta outflow would be significantly reduced much of the time, with decreases up to 39 percent of outflow, and associated increases in electrical conductivity (EC) would occur. As discussed above, these effects would constitute significant changes in the baseline conditions assumed in the adoption of the 1995 WQCP, the USEPA approval of that plan, the issuance of the USFWS biological opinion for Delta smelt and of the NMFS biological opinion for winter-run chinook salmon. X2 location (expressed in the 1995 WQCP as Delta outflow) is strongly correlated to the abundance of estuarine organisms at all trophic levels. While the X2 - abundance relationships are linked to a number of important causal factors, including optimal habitat surface area, the Draft EIR/EIS focuses on the surface area aspect alone in its assessment of potential impacts. As a result, the Draft EIR/EIS inadequately analyzes X2-related impacts, and Project-induced alteration of X2 location is rather cavalierly dismissed.

Delta outflows at the 1995 WQCP baseline condition levels during the rest of year, particularly in the November - January period, are also important in transporting juvenile fish downstream from the Delta, cueing migratory behavior, and preventing entrainment at in-Delta diversions and export facilities. D12-3

Accordingly, SWRCB and USACE should impose the following prohibitions on the Project:

- o most critically, no movement of X2 upstream as a result of Project operations under any conditions during the critical peak spawning and migration period from February through June.

- o no diversions to Project storage during the February - June period.

- o no movement of X2 upstream of Collinsville as a result of Project operations from July through September.

- o no movement of X2 upstream of Chipps Island as a result of Project operations from October through January.

Further terms and conditions governing impacts to X2 location and related concerns should be developed at the request of SWRCB and USACE by the California Department of Fish and Game (CDFG), USFWS, NMFS and USEPA (which was responsible for creation and refinement of the X2 requirement). These terms and conditions should include:

- o constraints on average and maximum movement of X2 as a result of Project operations during the July through January period, given the prohibitions above.

- o development of appropriate compensatory habitat in Suisun Bay and the western Delta to offset residual impacts to estuarine habitat and water quality from upstream movement of X2 as a result of Project operations during the July through January period. (Although the Project proponents commendably propose in Alternatives 1 and 2 to offset loss of

agricultural land with wildlife habitat values on two reservoir islands with operation of two islands for wetland and wildlife habitat, this measure does not compensate for X2/outflow-related impacts to estuarine species. Nor are construction-related impacts to spawning habitat mitigated by the habitat islands, and in-Delta wetland restoration may also be required.)

o constraints on Project diversions and discharges when Sacramento or San Joaquin River flows fall below prescribed, Project-specific threshold levels over and above the baseline 1995 WQCP conditions.

o constraints on diversions to or discharges from Project storage when designated abundance indices for Delta smelt, longfin smelt, Sacramento splittail and other species (which are listed or candidates for listing under the federal or state Endangered Species Acts and whose abundance is related to X2 and outflow values) fall below prescribed threshold levels. **D12-3 cont'd**

o dedication of a portion or percentage of Project discharge as augmentation flows to meet environmental objectives over and above the base requirements for Delta outflow and other 1995 WQCP criteria, in order to offset reductions in Delta outflow during the July - January period.

These prohibitions, constraints and other measures would not only help prevent overall estuarine habitat degradation from changes in X2 location and Delta outflows, but would also help prevent disruption of outmigration by juveniles of all Sacramento and San Joaquin River chinook salmon runs and of steelhead, and direct entrainment by Project diversions and indirect entrainment by other Delta diversions and export facilities of juvenile salmon and steelhead, and of the eggs, larvae and juveniles of Delta smelt, longfin smelt, striped bass and other Bay-Delta species, as a result of Project diversions.

<u>Impacts of Project discharges to export are inadequately addressed</u>

In addition to habitat degradation and disruption of fish migration from Project diversions discussed above, Project discharges for export use will also increase indirect losses of endangered species and other resources by increasing entrainment at the state and federal export facilities, adversely affecting temperature conditions, and through other means.

As discussed above, the 1995 WQCP's export criteria, and the federal agency actions based on adoption of these criteria, assume certain baseline conditions where Delta inflow and export are constrained by existing storage and export capacity. Project discharges for export use, particularly in the winter and spring periods, would significantly reduce QWEST values and increase exposure of eggs, larvae and juveniles of endangered species and other resources to entrainment at the CVP and SWP export facilities. Not including Project discharge as part of the 1995 WQCP Delta inflow/export ratio would further exacerbate these impacts. **D12-4**

In order to prevent these potential impacts, SWRCB and USACE should impose the following terms and conditions on Project discharge:

o prohibition of Project discharges for export use from January through June.

o during periods of Project discharge for export use, dedication of a portion or percentage of Project yield as Delta outflow augmentation flows over and above existing regulatory requirements in order to improve environmental conditions for transport of aquatic organisms to suitable downstream habitat areas; amount and use of dedication to be determined by CDFG, USFWS, and NMFS. **D12-4 cont'd**

Project discharges to Delta outflow may not provide anticipated benefits

The Draft EIR/EIS states that water supplies developed by the Project may be used to help achieve Delta outflow requirements or other environmental flow objectives. The Delta outflow requirements of the 1995 WQCP are based on the strong correlations between X2 location (expressed in the WQCP as outflow) and the abundance of estuarine organisms at all trophic levels. The X2 - abundance relationships are believed to be linked to a number of factors, including the occurrence of low-salinity shallow-water habitat; the contribution of riverine loading to the estuary's organic carbon budget; the Delta outflow-induced transport of eggs, larvae and juveniles of estuarine species to more productive habitat areas downstream; and the movement of anadramous fish in response to changes in flow throughout the watershed. Discharges from Project storage to meet Delta outflow requirements would not replicate all the complex processes occurring throughout the watershed that contribute to the X2 - abundance correlations and could therefore invalidate some of the benefits of the X2 - abundance relationship which otherwise would be expected. Compliance with the Delta outflow requirements under these conditions may consequently fail to fully protect estuarine habitat and other beneficial uses. SWRCB and USACE should prohibit the use of discharges from Project storage to replace releases from storage facilities in the upper watershed in order to help achieve Delta outflow requirements except under "supercritical" conditions (i.e., conditions resembling those of the 1976-77 drought) where upstream storage is not sufficient to achieve such objectives. Project discharges for augmentation flows to improve habitat conditions over and above upstream releases necessary to achieve base Delta outflow requirements would not be precluded by such a prohibition. **D12-5**

Recreation facilities

Recreation facilities should not be included in any Project alternative. Construction of these facilities is not required to meet any of the stated Project purposes (Delta export demands, Delta water quality needs, environmental flow requirements). More importantly, the size and extent of facilities called for in the Draft EIR/EIS represents an extremely significant increase in the occurence of marinas, hotels, and parking lots in the Delta region, and an associated increase in boat and automobile traffic and other disturbances. This component of the Project is non-essential and should be eliminated to avoid its adverse local and cumulative impacts to water quality, aquatic, wetland and wildlife habitat, and other beneficial uses of the Delta. **D12-6**

No-Project alternative

The Draft EIR/EIS describes the No Project Alternative as intensive agricultural operations on the four Project islands. This description overlooks other potential No Project Alternatives, including: purchase of one or more islands by federal, state and local agencies (using Category III or CVPIA Restoration Fund monies, for instance) for restoration of aquatic habitat and/or management of wetland and wildlife habitat; cooperative arrangements between Project proponents and federal, state and local agencies to restore one or more islands as aquatic habitat or manage one or more islands as wetland and wildlife habitat; agricultural operations on portions of one or more of the islands with adequate screening of agricultural diversions (co-funded by Category III, for instance) and other measures to reduce impacts of agricultural operations. Restricting the No-Project Alternative to intensive agricultural operation on all four islands using unscreened diversions appears to be a heavy-handed attempt to blackmail the lead state and federal agencies into approving one of the proposed alternatives. D12-7

Based on the degree of potential impact to beneficial uses from those aspects of Project operation discussed above, we urge SWRCB and USACE to withhold certification of the Draft EIR/EIS and issuance of permits. Please contact me at (415) 721-7680 if there are any questions regarding these comments.

Sincerely,

Gary Bobker
Policy Analyst

cc: interested parties

The Bay Institute of San Francisco

D12-1. Since this comment letter was submitted, the lead agencies have concluded formal consultation with DFG, NMFS, and USFWS on the effects of the Delta Wetlands Project on listed fish species. As part of the consultation process for compliance with the federal and California ESAs, USACE, the SWRCB, NMFS, USFWS, DFG, and Delta Wetlands agreed on the project operating parameters referred to as the FOC, which have been incorporated into the proposed project. DFG subsequently issued a no-jeopardy biological opinion regarding project effects on delta smelt and winter-run chinook salmon; NMFS issued no-jeopardy biological opinions regarding project effects on winter-run chinook salmon, Central Valley steelhead ESU, and Central Valley spring-run chinook salmon ESU and their habitats; and USFWS issued no-jeopardy biological opinions regarding project effects on delta smelt and splittail and their habitats. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for details about the formal consultation and discussion of the terms of the biological opinions.

See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, Including the CALFED Bay-Delta Program", regarding substitution of Delta Wetlands discharges for releases from upstream reservoirs.

D12-2. The impact analyses in the 1995 DEIR/EIS concluded that the project could result in several significant effects on water quality and fisheries; mitigation measures were recommended to reduce impacts to a less-than-significant level.

The FOC terms, developed through the federal and California ESA consultation process, place parameters on Delta Wetlands Project operations to ensure that the project would not compromise the protection measures included in the 1995 WQCP and the Water Accord. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

D12-3. DFG, NMFS, and USFWS addressed concerns about optimal salinity habitat and project effects on X2 by including in the FOC several terms that directly limit the change in the location of X2 that Delta Wetlands diversions would be allowed to cause. These terms are detailed in response to Comment A7-3. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for a summary of all terms included in the FOC and biological opinion RPMs. The operating parameters and compensation provided by these measures, in addition to constraints on changes in X2, include, but are not limited to:

requiring that Delta Wetlands conserve in perpetuity 200 acres of shallow-water rearing and spawning habitat as compensation for potential project effects on habitat;

replacing aquatic habitat lost as a result of construction activities at a 3:1 ratio;

prohibiting diversions in April and May and limiting diversions to a percentage of outflow, surplus flow, and San Joaquin River inflow in other months;

specifying periods of delay for the beginning of diversions and reductions in Delta Wetlands operations when the FMWT index is less than 239, and requiring that diversions and discharges be reduced if protected fish are observed in the required daily fish monitoring;

limiting discharges for export from Bacon Island to 50% of San Joaquin River inflow in April through June and prohibiting discharges for export from Webb Tract in January through June; and

requiring that Delta Wetlands set aside a percentage of discharges in February through June as "environmental water".

D12-4. Delta Wetlands discharge to export would not affect QWEST because both the discharge points (Webb Tract and Bacon Island) and the SWP and CVP export facilities are east of the channels included in the calculation of QWEST. See response to Comment D12-3.

D12-5. If Delta Wetlands were to discharge to outflow as a substitute for controlled releases from upstream reservoirs, Delta Wetlands Project operations would have to be integrated with SWP and CVP operations. No proposals for which the lead agencies could reasonably assess the environmental effects have been made to coordinate Delta Wetlands Project operations with, or integrate them into, upstream water facility operations. See Master Response 1, "Project Objectives: Analyzing Effects of Water Transfers, Banking, and Augmenting Outflow", and Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

D12-6. The recreation facilities are part of the overall project purpose as defined by the applicant. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities", for a discussion of project impacts associated with recreational uses.

D12-7. The No-Project Alternative is based on the assumption that intensified agricultural conditions represent the most realistic scenario for the Delta Wetlands Project islands if permit applications are denied. The lead agencies developed the description of the No-Project Alternative based on the stipulation that no discretionary actions, as defined by NEPA and CEQA, would be needed. The commenter's suggested alternatives are actions that would require discretionary permits and therefore do not meet the definition of the No-Project Alternative. The Delta Wetlands Project alternatives (Alternatives 1, 2, and 3) were selected to represent a range of project operations that meet the project purpose and need for purposes of determining environmental impacts. The alternatives suggested by the commenter do not meet the purpose of the proposed project and would not be implemented by the project applicant if permit applications are denied. See also response to Comment C2-5.

Letter D13

Marin Audubon Society Box 599 Mill Valley, California 94942-0599

December 21, 1995

Jim Monroe
U.S. Army Corps of Engineers
Regulatory Branch
1325 J Street
Sacramento, CA 95814-2922

Jim Sutton
State Water Resources Control Board
Division of Water Rights
P.P. Box 2000
Sacramento, CA 95812-2000

RE: COMMENTS ON DEIS/R FOR DELTA WETLANDS PROJECT

Dear Mr. Sutton and Mr. Monroe:

The Marin Audubon Society appreciates the opportunity to comment on the DEIS/R for the above project. Before getting into our comments, we would like to request that the comment period be extended to allow for distribution and review of proposed changes that may result in the project with regard to fish impacts as a result of consultation between DW and federal and state agencies. **D13-1**

The EIS/R is inadequate in many ways. It does not adequately identify adverse impacts of the DW project, fails to adequately analyze many adverse impacts that are identified, and fails to develop and discuss adequate mitigation measures to offset or compensate for project losses. The severity of a number of habitat impacts is understated. Many mitigation impacts and mitigation measures dependent on future study which removes these issues from public review and from decision-makers during their decision-making process. Providing information is one of the main purposes of CEQA and NEPA. Further, the EIS/R fails to adequately address the cumulative impacts of the project. By and large, it focuses on localized individual impacts while cumulative analyses are cursory and inadequate. **D13-2**

The EIS/R gives the impression that there really won't be more water diverted because the water will only be diverted when there is a "surplus." Well, the so-called "surplus" is a man-created delineation based on water rights decisions for the estuary. Water rights decisions may or may not provide the answer to **D13-3**

restoring a healthy estuary. They are political and legal decisions based, to some extent, on biological information which is clearly inadequate. Much is still to be learned about fresh water needs of many species, and downstream resources at Suisun Marsh, San Pablo and San Francisco Bay. Nor are the issues of needs of these downstream resources, and of the impact of continued removal of high flows from the estuary, addressed.

It is well recognized that the San Francisco Bay and Delta Estuary is in a dramatic state of decline with increasing number of species becoming endangered, and considerable debate and legal action going on for many years. Yet the **Background** information (page S-1) does not even mention this critical information. Instead, the EIS/R takes the approach that all is well, that this project will result in no additional water loss to the resources because water will only be diverted when there is a "surplus." The term "surplus" does not reflect that the water is not needed by the estuary resources. In fact, the diversion of only surplus water is still a loss to the estuary resources because the water that will be diverted by DW would be new rights, i.e. water not diverted now. **D13-3 cont'd**

The EIS/R focuses on mitigations that provide physical habitats (wetlands, ponds etc.). While even these have some problems, no wetlands compensate for the loss of fresh water. The failure to discuss and analyze possible reduce project alternative or mitigation that would require discharge of DW diverted water when it is needed to benefit the estuary and its fish and wildlife species is a major flaw.

Our questions and comments on specific sections of the DEIS/R are:

SUMMARY

Page S-1 The purpose of the DW project is identified as "to divert surplus water...." The notion of surplus waster is associated with CA water rights. All water passing through the estuary is useful and needed to support fish and other aquatic resources dependent on the estuary. Therefore, no water can really be considered surplus. **D13-4**

CHAPTER 2 PROJECT DESCRIPTION

Page 2-13
Discuss the implications and the potential impacts of allowing DW to appropriate seepage and return flow from cover crop irrigation. What constituents would be carried by the irrigation return flows? How could these impact fish and other aquatic resources. **D13-5**

CHAPTER 3D FLOOD CONTROL

Page 3D-10

Why would wells installed near the toes of existing levees limit or eliminate seepage? How would these wells impact existing habitats? Would they increase the potential for erosion? Where have they been used successfully? **D13-6**

Page 3D-11

Isn't less pervious material be more suitable for levee construction than sand? Evaluate the potential for using material dredged from San Francisco Bay or the elsewhere in the Delta? What are the impacts of the previous uses of dredge material to stabilize Delta levees? **D13-7**

Page 3D-15

Impact/Mitigation D-3 calls for riprap on interior levee slopes of reservoir islands to prevent erosion. Is erosion also a potential problem on the interior slopes of habitat islands? What measures would be taken to control erosion on the habitat islands? What habitat impacts could result from these erosion control measures? **D13-8**

CHAPTER 3F FISHERY RESOURCES

Page 3F-1

Significant potential impacts to reproductive success of Delta Smelt, Sacramento splittail and other Delta species would not be just localized. The local impacts would contribute to cumulative adverse impacts on these species. **D13-9**

Page 3F-2

All native fish species that use the Delta would potentially be adversely impacted by diversion of water for the project. Discuss the potential effects of the water diversions proposed by the project when considered cumulatively with other diversions on the flowing native species that are in decline: Starry flounder, yellowfin goby, Pacific lamprey, white sturgeon, Tule perch? **D13-10**

Page 3-F 4

Why is the dramatic decline in fresh water flows not mentioned as a factor associated with the decline in salmon? Is it not true that the decline in populations of most of not all native fish species is directly related to the amount of fresh water flows? **D13-11**

Page 3F-14, 15

The statement is made that the proposed location of the facilities is not in what is believed to be preferred spawning or rearing habitat for Delta smelt or Sacramento splittail. Is the project in spawning or rearing habitat of any native fish species? **D13-12**

What kind of habitat would be required for the restoration requirements in Mitigation F-1? **D13-13**

How would the water diversions of the project, when considered together with existing diversions, affect the location of the entrapment zone? D13-13 cont'd

Page 3F-17

Impacts from accidental spills from recreational boat use are described as being random and concentrated in specific locations, and therefore as having localized impacts that are less-than-significant. To the contrary, toxic spills could very well have a significant impact on local populations and a significant cumulative impact. D13-14

Also, what impact could sewage and gray water have on fish populations locally and cumulatively? What measures could reduce impacts of toxic spills from recreational boats in marinas? Evaluate the use of restrictive management of marinas and requirements to have pump out facilities and bathrooms on-shore. D13-15

Page 3F-22

How realistic is the assumption that 50% of Delta smelt spawn east of the Sacramento River and 50% on the west side? D13-16

Page 3F-23

How much total shallow water habitat suitable for spawning and rearing of splittail, smelt and other native fish, would be converted to deeper water habitat by the project? Where would the habitat be located? Discuss the usefulness for native fish of the habitat that would be created? Would the habitat be on the inside or managed sides of the habitat islands? Would this limit its usefulness to native fish? D13-17

That entrainment would affect "only local populations" does not recognize that impacts of this and many other diversions would add up to be cumulatively significant. The loss of many local populations is not a less than significant impact, particularly when that species is in decline is an inaccurate statement. D13-18

Page 3F-24

Mitigation Measure F-3 would "minimize" changes in cross-Delta flow conditions. The goal should be to avoid changes that would adversely impact endangered and special status species. What measures were investigated that would avoid cross-Delta flows? D13-19

Page 3F-25 - 26

Mitigation F-4 As addressed above, the goal should be to avoid entrainment loss of Delta smelt and longfin smelt larvae. What measures have been evaluated that could avoid entrainment loss of these special status species? D13-20

Impact F-6 (page 3F-26) This analysis states that diversion of water for the project could cause a shift of X2 upstream but that D13-21

this is less-than-significant because habitat changes would be small, diversions infrequent, salinity degradation would be of short duration, and optimal salinity habitat April through August would slightly increase due to changes in agricultural diversions. The reasons given for the determination of less-than-significant impact are uncertain, subject to change, fail to consider cumulative impacts of existing diversions and minimizes the significance of existing impacts on the location of X2 from current diversions. Therefore, this analysis understates the significance of the impact and is faulty and inaccurate. **D13-21 cont'd**

To provide for more adequate mitigation of impacts to the location of the entrapment zone, we recommend that the EIS/R evaluate the release of water from the project as an alternative mitigation. Evaluate an alternative mitigation that would require releases of project water to ensure the entrapment zone is maintained at Suisun and to provide other environmental benefits needed to protect the estuary. **D13-22**

Page 3F-27

Mitigation Measure F-5 indicates that DW intakes would include "effective" fish screens that would not directly entrain juvenile smelt. There is no information provided about how effective fish screens are these days. Have there been advances in recent years? What size fish are excluded? Are larvae still caught in the mesh? **D13-23**

What is meant by habitat restoration as an example of an alternative action to mitigate unavoidable DW project impacts? Does this mean restoring more wetlands or providing increased flows for fish and wildlife? How much additional area is available to increase wetlands restoration? Aren't all of the islands identified for some mitigation or restoration already? What other alternative actions are possible to mitigate deficiencies in the management plan that do not provide adequate mitigation? **D13-24**

Discuss whether the trapping of fish in the reservoirs is a potential impact of the project? **D13-25**

Page 3F-35

A major element of habitat for fish is fresh water. No matter how much shallow spawning and rearing habitats are available, most species native to this part of the estuary are dependent on adequate amounts of fresh water for spawning and rearing, and for movement out of the estuary. What is meant by "habitat" as it is used in the cumulative Impacts discussion? **D13-26**

There is no evidence presented that "total Delta habitat would likely increase under existing and future Delta programs" nor is it clear what such an increase would involve. Does habitat increase mean increase in a particular type of wetlands or **D13-27**

increase in flows, or both. Also, the goal might be to achieve a habitat increase, but this may not necessarily be the end result. D13-27 cont'd

Impact F-17 states that the amount of habitat affected by construction and maintenance activities under cumulative conditions would be small relative to the total amount of similar habitat in the Delta. How can this assessment be made considering that many of the levee banks are riprapped and no longer vegetated with riparian vegetation? Although the amount of existing habitat may sound large, it pales in comparison with historic (pre-diversion south) conditions. Therefore, the comparison is with a degraded and stressed habitat. The habitats impacted may seem small but would contribute to the cumulative significance of the losses. In addition, there is no evidence that the kind of habitat that would be created is the habitat type needed by the native special status species. D13-28

Relying on future unspecified measures that "would likely increase" Delta habitat other programs, including the CALFED agreements, Category III measures, and actions from the Anadromous fish program, does not satisfy CEQA. Measures to mitigate project individual and cumulative should be assured by each project, including DW. D13-29

Page 3F-36

The discussion of cumulative impacts under **Potential Flow and General Habitat Effects** is focused on impacts to the project than the resources. "Under future conditions, surplus flows are likely to be less available than under existing conditions." "The major difference is that under cumulative conditions, less water would be available for DW to divert." What does this mean to fishery resources? If there is less water for DW to divert but DW diverts what is perceived by the SWRCB to be surplus, that means there is less water in the system, and therefore, less water for the fish. The diversions would still have an impact on estuarine dependent species. If other water rights holders have acted on their allotment and/or it is a low rainfall years, it is still the fish that suffer. D13-30

The effect would not be the same for fish and other aquatic resources, as stated in paragraph two (page 3F-37). This would mean less water flowing through the estuary and less water for fish. What would this mean for the Delta Smelt, splittails and other native fish species?

What are the potential cumulative impacts on fish and wildlife resources downstream in Suisun Marsh and San Francisco Bay? What impacts could reasonably be anticipated with the cumulative water loss to wetlands of Suisun Bay, San Pablo Bay and the South Bay? What is the potential for the water diversions, when considered cumulatively with other diversions, to affect a change in the vegetation pattern in the Delta? What is the potential for the D13-31

diversions when considered cumulatively with other diversions to affect a change in the vegetative pattern of the Suisun Marshes and San Pablo Bay marshes? D13-31 cont'd

What if it is later identified that higher levels of fresh water discharge is needed to benefit those habitats and the species that depend on them?

Evaluate an alternative mitigation under which DW would be required to release fresh water to mitigate flow and general habitat impacts to native fish, plants and other estuarine dependent species. D13-32

Page 3F-37

Why is restoration of fish habitat uncertain (see mitigation Measure F-1) while habitat restoration of wetland habitat is not? D13-33

The Mitigation Measures under Potential Species-Specific Effects all refer to Mitigation Measures for individual, localized impacts. This is not adequate. Cumulative adverse impacts on species must also be addressed. Further, the discussion minimizes the potential impacts of cumulative loss of fresh water on fish, wildlife and wetlands. Cumulative impacts cannot help but be more severe because of the already degraded state of the Estuary and pre-existing and proposed diversions. D13-34

Evaluate the need and potential for water diversions to DW to be reduced to mitigate cumulative impacts of water loss for specific species?

CHAPTER 3G VEGETATION AND WETLANDS

Page 3F-3

The last paragraph states "The portions of the four DW project islands included in Alternatives 1 and 2 encompass 20,128 acres...." How many acreage of each habitat type is included in this acreage figure? This figure is not given for all habitat types. D13-35

Page 3G-12

Are any special status plant species located on the sites where construction would occur? If so, how would these losses be mitigated? Address moving the facilities as a possible mitigation.

Developing a Mitigation Plan is suggested as mitigation for loss of special status species. Developing a Plan is not adequate in itself as a mitigation. The Plan must be satisfactorily implemented, monitored and the correction of deficiencies assured. D13-36

Would any special status plant species be lost through D13-37

inundation? D13-37 cont'd

Page 3G-13

How old is the 203-acre riparian woodland noted in Impact G-5 that is jurisdictional wetland? How long would it take to replace the values and functions provided by this mature habitat? How is this time difference accounted for in the identified mitigation acreage? What amount of additional acreage would be provided to adequately compensate for the loss acreage and the time lag for the new habitat to mature? D13-38

Mitigation Measure G-4 calls for implementing an off-site plan for mitigating impacts to jurisdictional wetlands. Why can't these wetlands be mitigated on-site, which is far preferable? The discussion should demonstrate why on-site mitigation is not possible. If on-site mitigation is not possible, reducing or revising the design of the project to avoid disturbance to some or all of the existing wetlands should be evaluated. D13-39

It has not been demonstrated (Impact G-6) that Measures G-1, 2, and 3 would reduce impact G-6 to a less-than-significant level. D13-40

Page 3G-15

Impact G-7 states that implementation of Alternative 1 in conjunction with implementation of other Delta projects (Interim South Delta Program, Interim North Delta Program, Sherman Island Widlfie Management Program, etc.) would increase the acreage of permanent and seasonal wtlands. This project cannot take credit for measures implemented by other entities, nor is it known whether the other restorations would be implemented or be successful. D13-41

Peak flows serve important functions for fish and the estuarine systems. Discuss potential impacts of further reduction in peak flows through the estuary due to increased diversions? D13-42

CHAPTER 3H WILDLIFE

Page 3H-12 The Criteria for Determining Impact Significance should be revised to include "disruption to the movement of wildlife" as is identified in CEQA Guidelines. D13-43

The statement is made near the end of the second column that Tables 3H-2 and 3H-3 present the frequency with which each of the five conditions would be expected to occur on the reservoir islands. Actually a footnote on these Tables states a significant uncertainty about the duration and viability of habitats: "Frequencies (shown on tables) were estimated based on the 70-year hydrologic record for the Delta. The frequency with which each flood condition class would occur in future years, however, is unpredictable. Frequencies do not include years when reservoir islands may be used for water transfers or banking...." D13-44

This uncertainty renders any habitat mitigation value virtually meaningless because there is no measure of dependability that the habitats would be available when wildlife need them. Therefore, habitats created on these islands should not be cited or credited for any habitat mitigation. **D13-44 cont'd**

As pointed out in the discussion, nesting of terns, waterfowl and other species could be destroyed by diversions and discharges from the DW project. This should be considered an adverse impact. Destruction of established nests of migratory waterfowl and other migratory birds is particularly troubling because DW would create conditions favorable for nesting which would encourage birds to not migrate but to stay and nest here. Once drained birds there would likely be insufficient time or habitat available to attempt to nest again. Therefore, DW would be contributing to reduced production of the Pacific Flyway populations of these species. This should be considered a significant impact. What measures could mitigate this impact? **D13-45**

Page 3H-16 to 18

Neotropical songbirds are in decline worldwide and impact on them should be addressed. What neotropical songbirds use the four islands and, therefore, could be impacted by the project? **D13-46**

Page 3H-19

The first paragraph second column states that the primary goals of the HMP are to describe the habitat island habitat and management requirements necessary to offset impacts of reservoir island operations on state listed threatened species, wintering waterfowl habitat and jurisdictional wetlands. This is inadequate to mitigate potential impacts of the project. Migratory birds are protected under Migratory Bird Treaty Acts. Neotropical songbirds are in a state of decline worldwide. Impacts on migratory songbirds that may be using the site, on migratory waterfowl and shorebirds and on resident species should also be addressed and mitigated. **D13-47**

Page 3H-22

The discussion of Impact H-3 **Loss of Foraging Habitats** for Wintering Waterfowl indicates that high quality foraging habitats would be created on the habitat islands, therefore, this impact is less than significant and no mitigation is required. We strongly disagree. While the habitat itself may be high quality, the birds use of the habitats would be limited and precarious because they would be subject to extensive disturbance from hunting, aircraft using the airport and other recreational uses, that their value would be substantially reduced. **D13-48**

Therefore, habitats with these impacts cannot be considered high quality and, therefore, mitigation for these impacts should be addressed. Moving the runway to the hunting zone should be considered as a mitigation to reduce habitat impacts to a less

than significant level. Creating additional wetland habitats that do not have hunting or aircraft disturbances and reducing the area available for hunting should be evaluated as mitigation measures. D13-48 cont'd

Impact H-3 Credit is also taken for habitat created on the reservoir islands. Because of the uncertainty in time and quality of these habitats, as discussed elsewhere, no credit should ben taken for any habitats on the reservoir islands. D13-49

With regard to the reference to establishing duck nesting habitat in Impact H-4, how much duck nesting habitat, if any, would be counted on the reservoir islands? On what islands would the sandhill crane habitat (Impact H-6) be created? D13-50

How much suitable habitat would be lost for neotropical songbirds and other native upland birds? How much suitable habitat would be created for neotropical songbirds? D13-51

Page 3H-23

Impact H-7 explains that roosting habitat would be provided for sandhill crane. Would the foraging and roosting habitats would be situated close together as the cranes prefer, or would they have to travel some distance? D13-52

How long would it take for trees to grow large enough to provide perching and nesting sites for Swainson's hawk?

Page 3H-24

The construction mitigation plan should include a component that limits construction to non-nesting seasons. D13-53

Mitigation for impacts of aircraft flights on sandhill crane should consider relocating the airport runway to a location away from the sandhill cranes. Avoidance of the impact should be considered prior to the Measures noted in Measure 3H-16 that would be less certain effectiveness. D13-54

Page 3H-26

The discussion of Impact H-17 states that waterfowl would be widely distributed because hunting would periodically disturb the birds. Wouldn't disturbance due to hunting tend to result in the birds concentrating in smaller areas to avoid the hunting zone? D13-55

How would the hunting restrictions be required and enforced? D13-56

Consumptive recreational uses are provided for, however, no opportunity for passive non-consumptive recreational uses are provided. This impact should be mitigated by establishing areas where birders and walkers could use and be safely away from hunters and not disturb the birds. D13-57

Recreational facilities are strung out along the entire boundary of each island. This would mean that no edge would provide safe, undisturbed habitat for wildlife. This should be identified as a significant impact because it would reduce the value of both the habitat and reservoir island habitats, and render them less usable by wildlife. Effective and suitable mitigation habitat does not have disturbances from aircraft, various"recreational" uses such as hunting and boating, as well as potential drain the habitats during nesting season. What measures would mitigate the impacts on wildlife of the various human uses proposed by the project? Measures such as reducing the number of recreation uses and facilities, or bringing them closer together so that large sections of edge habitat are undisturbed should be among those assessed. **D13-58**

Page 3H-27

Regarding Impact H-20, no evidence is presented that there would be an increased duck production on the habitat islands sufficient to offset duck harvest from hunting? What amount of production would be need to offset hunting losses? How many ducks are anticipated to be shot? Evaluate the cumulative significance of increased harvest on the statewide waterfowl population. **D13-59**

Impact H-22 There is no evidence presented that compliance with existing water quality objectives and other requirements would ensure there would not be salinity changes that would be detrimental to wildlife. The entire estuary is in a state of decline. The water quality objectives are not necessarily based on biological knowledge but in large part on political pressure. **D13-60**

Page 3h-27

How would reduced flows to Suisun marsh and San Francisco Bay impact waterfowl, neotropical migrants and other non-game species that depend on those habitats? **D13-61**

Additional Questions from HMP

The discussion on HMP page 10 states that vegetation may be removed periodically from channels etc. for maintenance of water management functions. This could substantially reduce the habitat values of these areas. How many acres of what kind of habitat would this involve? Has this been credited for mitigation for loss of a certain habitat type? **D13-62**

Comments on: DRAFT HABITAT MANAGEMENT PLAN FOR THE DELTA WETLANDS HABITAT ISLANDS

Page 2 **Species Goals** Impacts to all migratory species, not just waterfowl, should be mitigated. **D13-63**

Why is so much of the mitigation acreage for the Swainson Hawk concentrated on the reservoir islands? Would any of it be covered with water for part of the year? How would water coverage effect its value? D13-63 cont'd

Page 3 Compensation Requirements The first paragraph should be rewritten to clarify. The discussion appears to indicate that jurisdictional wetlands are artificial wetlands. The discussion also seems to indicate that open water, grain and seed crops, grasslands and unvegetated disturbed areas are also in the jurisdictional wetland category. D13-64

Page 4 Why are the compensation requirements for waterfowl foraging habitat not at least equal to the amount of existing habitat?. Existing is 10,514 acres and only 8,220 would be required to be replaced? D13-65

Page 5 Explain how roost sites that would be created would be located close to foraging sites to ensure maximum habitat? Although the discussion indicate that cranes prefer roost and foraging sites nearby, it is not clear that the project would accomplish this. D13-66

Page 6 Would nesting boxes or platforms would be located on reservoir islands? Although July 15 is used as a rule of thumb for the end of nesting season, nesting for some species can extend beyond that date. Therefore, draw down occurs on July 15, nests could be destroyed. Project conditions should require that draw-down be delayed until nestlings fledged. D13-67

Recreation Consumptive recreational uses are well provided for, however, how are recreational interests that are not provided. This deficiency should be mitigated by establishing areas where non-consumptive users such as birders, walkers etc. could observe wildlife while not disturbing them and also be safe from hunters. D13-68

Page 11 Why are the Lake Islands proposed to be so small? D13-69

The authority of the HMAC is defined as to make recommendations to DFG and DW. Therefore, although they should be a part of the discussions, neither of these entities should be members of the Committee. Committee members should be chosen and charged to clearly represent the interest of a particular species or group of species in order to avoid needs of some species being neglected. For example, a particular representative should be appointed to represent waterfowl another migratory songbirds, another raptors etc. D13-70

Page 17 The discussion references Table 25 which shows performance goals to identify the need for management changes. Standards are also necessary to evaluate the success of failure of aspects of the project. However, these tables show no D13-71

performance standards identifying target numbers of birds expected to use the different habitat for forage, roost and to nest. To evaluate the success of the project, target populations should be established for each species and for each habitat type being created for mitigation on the habitat islands. Target numbers should be identified for each life cycle function. Nesting success should be measured in the number of live young produced for each species **D13-71 cont'd**

Page 20 **Long-Term Maintenance of Emergent Marshes** indicates that although dense stands of emergent vegetation may reduce habitat value for waterfowl, it increases habitat for other species such as Marsh Wren, Swamp Sparrow and Yellowthroat. What species would be displaced with this management? How can it be assured that some habitat will remain for these species? **D13-72**

Who will responsible for enforcement or provisions of project approvals? **D13-73**

Page 21 As stated above, we recommend that the airstrip be located within the hunting zone in order to avoid impacts to better ensure compliance with the mitigation for project. Since little or no hunting takes place on these islands, hunting will be an entirely new impact, in addition to primary impacts of the project, therefore, wildlife using the non-hunting areas should not be subject to disturbance simply to support another use that has degrades habitat values if only by reducing the time wildlife can use it. Airstrip simply extends the impacts of the project by extending areas of disturbance to wildlife. **D13-74**

Thank you for considering our comments.

Sincerely,

Barbara Salzman, Chair
Conservation Committee

Marin Audubon Society

D13-1. The SWRCB and USACE extended the comment period by 30 days (to December 21, 1996) in response to this and other requests. Results of formal consultation under the federal and state ESAs for the Delta Wetlands Project were presented in the 2000 REIR/EIS.

D13-2. The 1995 DEIR/EIS includes a detailed discussion of the impacts associated with the proposed Delta Wetlands Project and identifies mitigation to avoid or minimize those impacts. Each resource chapter also addresses the cumulative impacts of the Delta Wetlands Project when considered in combination with the impacts of other current and reasonably foreseeable future projects. The mitigation measures presented in the 1995 DEIR/EIS are of sufficient detail to, at a minimum, describe to reviewers the steps necessary to reduce the impacts to less-than-significant levels. Additional detail regarding mitigation and monitoring of listed fish species was developed as part of the ESA consultation process and was included in Chapter 5 of the 2000 REIR/EIS. See Chapter 3F in Volume 1 of this FEIS.

See the responses to more specific comments (D13-4 through D13-74) below.

D13-3. The 1995 DEIR/EIS recognizes the delicacy of the Bay-Delta environment and identifies the effects the project would have on biological resources in the Delta (see Chapters 3F, 3G, and 3H). Certain assumptions were made in the 1995 DEIR/EIS about the adequacy of the 1995 WQCP for protection and recovery of fishery resources; however, it is not within the scope of the NEPA and CEQA analysis to address whether USFWS, NMFS, and other federal and state agencies set the 1995 WQCP and other Delta regulations at a level that would only protect the recovery of fishery resources with an undetermined amount of "surplus flows". The biological opinions for the Delta Wetlands Project issued by USFWS, NMFS, and DFG in 1997 and 1998 place numerous additional restrictions on project operations to ensure that Delta flows and water quality remain at levels that would be protective of aquatic resources. See also response to Comment A4-7.

D13-4. The term "surplus water", or "surplus flows", is used to refer to flows that are in excess of those required to satisfy the outflow objectives of the 1995 WQCP. It is beyond the scope of the NEPA and CEQA analysis to address whether the objectives of the 1995 WQCP are adequate.

D13-5. The commenter is referring to the description of proposed uses of water on the habitat islands that appears on page 2-13 of the 1995 DEIR/EIS (page 2-15 of FEIS Volume 1). Diversions and discharges of water to and from the habitat islands would not differ substantially from existing agricultural practices, and diversions to the habitat islands would be performed under Delta Wetlands' existing riparian and appropriative water rights. Therefore, the contribution of water quality constituents from these islands would not change appreciably under project implementation. Additionally, the FOC terms prohibit Delta Wetlands from discharging water from the habitat islands for export;

therefore, the description of these potential project operations on page 2-13 of the 1995 DEIR/EIS is no longer valid.

D13-6. The commenter is referring to the description of relief wells on page 3D-10 of the 1995 DEIR/EIS (page 3D-11 of Volume 1 of this FEIS). Relief wells are a common solution for controlling seepage at toes of dams and levees. See response to Comment C15-7. Installation of relief wells would be unlikely to affect existing habitats. If relief wells were used, they would be installed at the toe of the interior of the levees; most of these areas are currently in agricultural use. Operation of relief wells would not increase the potential for erosion.

D13-7. As described in the 1995 DEIR/EIS, material suitable for levee improvements would be obtained from the interior of the Delta Wetlands Project islands. See Appendix H of the 2000 REIR/EIS for more information on the geotechnical investigations conducted for the Delta Wetlands Project. The bulk of the levee improvements for the project islands are at the toe berm or interior surface of the levee where free-draining sandy soils function well and are appropriate material. A less permeable material likely would be used to raise the tops of the levees. As described in the 2000 REIR/EIS, the materials used for levee improvements would be subject to final design and would depend on site-specific conditions.

The commenter suggests investigating the use of dredged material for levee improvements on the Delta Wetlands Project islands. The benefits and impacts associated with using dredged material for levee improvements are hotly debated. Most debates center around the potential effects on water quality of using material from San Francisco Bay, where substantial amounts of salt and various contaminants are deposited annually. Because the cost of transporting dredged materials to the Delta Wetlands islands would be high and the potential adverse effects of using such material is not known, the Delta Wetlands Project would not use dredged materials for levee improvements.

D13-8. Establishment and maintenance of habitat on Bouldin Island and Holland Tract would not erode those perimeter levees. Erosion on the interior of the reservoir island levees would be caused by wind and wave action from the stored water. Because the habitat islands would not store substantial amounts of water adjacent to the levees, erosion conditions on the interiors of the habitat island levees would not differ from existing conditions. Routine levee maintenance activities on the habitat islands would be similar to existing measures. See page 2-11 of the 1995 DEIR/EIS (page 2-12 of FEIS Volume 1).

D13-9. The commenter is referring to the list of potential project impacts in the summary of Chapter 3F. The impact discussion later in the chapter explains the basis of the impact conclusions summarized in this section and describes cumulative impacts. The impact analysis in the 1995 DEIR/EIS identified alteration of spawning and rearing habitat not only as a direct, localized impact (Impact F-1), but also as a cumulative impact (Impact F-17, "Alteration of Habitat under Cumulative Conditions"). Alteration of habitat under

future cumulative conditions was considered a less-than-significant impact for three reasons:

the amount of affected habitat would be small relative to the total amount of similar habitat in the Delta,

the effects would generally be temporary, and

total Delta habitat is likely to increase under existing and future Delta programs.

D13-10. The 1995 DEIR/EIS analysis specifically evaluated fish species whose habitat requirements and distribution are representative of the fish community found in the Bay-Delta; evaluating how these species would respond to the Delta Wetlands Project makes it possible to determine the range of potential impacts on all Delta fish resources. Available information indicates that the habitat conditions included in the evaluation encompass the needs of starry flounder, yellowfin goby (an introduced species), Pacific lamprey, white sturgeon, and tule perch; therefore, additional species-specific evaluation is not necessary.

D13-11. The relationship between the decline in the abundance of the fish population and reduced freshwater flows is not direct. The relationship is complicated by natural variability in flows within and between years. Flows during any particular month can be several times greater or less than flows during other months or years. In addition, although the annual flow volume may not differ substantially from the unimpaired flow volume, reservoir operations and changes in runoff patterns caused by urbanization or agricultural practices may have shifted the monthly timing. Loss of or changes to structural habitat, volume of flows or diversions, and other factors contribute to conditions that have resulted in the decline of many fish species in the Sacramento-San Joaquin basin. Flows affect the decline of fish populations, but a greater flow does not necessarily result in more fish in all years.

D13-12. The predominant type of fish habitat that surrounds the project islands and could be affected by construction activities is steep riprap levee slopes that border relatively deep channels. Available information does not indicate that the riprapped levee slopes are optimal spawning and rearing habitat for any native species.

D13-13. Mitigation Measure F-1 has been replaced by several FOC terms and RPMs described in the DFG, NMFS, and USFWS biological opinions for the project. One measure requires Delta Wetlands to replace at a 3:1 ratio any aquatic habitat lost as a result of construction activity. The type of habitat to be replaced to meet the mitigation requirements would depend on the type of habitat affected and the species and life stage of the species that would use the habitat. Delta Wetlands probably will be required to restore shallow vegetated habitat that would contribute to the resource agencies' ongoing restoration goals. Another FOC measure requires Delta Wetlands to conserve in perpetuity 200 acres of shallow-water rearing and spawning habitat. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

The effects of Delta Wetlands operations on the location of the entrapment zone are represented by estimated changes in X2 (Table 3F-2 in Chapter 3F), where X2 is the approximate upstream edge of the entrapment zone. The biological assessment (Appendix F2 of the 1995 DEIR/EIS) provides detailed information on potential project effects on X2. See Master Response 4 and response to Comment A7-3 for information about specific limits described in the FOC that govern project effects on the X2 location.

D13-14. Available information does not support the comment that toxic spills from recreational boats could significantly affect local fish populations. Existing regulations govern operations of recreational facilities and boats. The FOC requirement that Delta Wetlands conserve in perpetuity 200 acres of shallow-water rearing and spawning habitat mitigates the potential increase in toxic spills from boating that may be associated with implementation of the Delta Wetlands Project. See also Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

D13-15. Existing regulations govern the operations of recreational facilities, including the discharge of sewage. The Delta Wetlands Project is not expected to significantly affect fish populations through discharge of sewage or other toxic materials. See response to Comment D13-14 regarding mitigation of potential effects on fish.

See also Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities". Delta Wetlands does not propose to provide pumpout facilities for boats because pumpout facilities are available in the vicinity of the project islands and in other locations throughout the Delta (see Figure 3E-4 of Chapter 3E, "Utilities and Highways").

D13-16. The best available information was used in the impact assessment. The assumption that 50% of the smelt spawn on the Sacramento River side of the Delta and 50% on the San Joaquin River side provides for a conservative assessment (i.e., a scenario resulting in higher adverse impacts). Delta smelt appear to spawn primarily on the Sacramento River side of the Delta, further away from the influence of central- and south-Delta diversions and exports. The actual spawning distribution is currently unknown but probably varies according to water quality and flow conditions before and during spawning. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for a summary of the FOC terms and RPMs that reduce potential effects of the project on delta smelt to a less-than-significant level.

D13-17. Shallow-water habitat would not be converted to deep-water habitat under the proposed project. See response to Comment D13-13 regarding FOC terms and RPMs that compensate for alteration of habitat. No shallow-water habitat would be provided on the habitat islands to offset project effects on fish.

D13-18. The commenter is referring to the discussion of entrainment of splittail. Splittail spawn primarily upstream of the Delta; therefore, entrainment of larvae resulting from Delta Wetlands Project operations would be minimal. Salvage records for the SWP and CVP

indicate that entrainment of Sacramento splittail is restricted primarily to juveniles and adults. Juvenile and adult splittail would be large and would not pass through the Delta Wetlands fish screens. Because Delta Wetlands diversions would entrain or impinge few splittail, the impact was determined to be less than significant.

D13-19. Cross-Delta flow is an index of habitat conditions that may increase entrainment in central- and south-Delta diversions. Delta Wetlands diversions and discharges to export would increase cross-Delta flows. Mitigation Measure F-3 was proposed in the 1995 DEIR/EIS to reduce to a less-than-significant level Impact F-4, "Potential Increase in the Mortality of Chinook Salmon Resulting from the Indirect Effect of Delta Wetlands Project Diversions and Discharges on Flows". This impact is now addressed by several FOC and biological opinion RPMs that replace Mitigation Measure F-3. See "Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows, Downstream Transport, Area of Optimal Salinity Habitat, and Entrainment" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

D13-20. Mitigation Measure F-4 was proposed to reduce to a less-than-significant level Impact F-5, "Reduction in Downstream Transport and Increase in Entrainment Loss of Striped Bass Eggs and Larvae, Delta Smelt Larvae, and Longfin Smelt Larvae". This mitigation included actions to minimize changes in cross-Delta flows and reduce the subsequent effects on striped bass, delta smelt, and longfin smelt. Impact F-5 is now addressed by several FOC and biological opinion RPMs that replace Mitigation Measure F-4. See "Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flows, Downstream Transport, Area of Optimal Salinity Habitat, and Entrainment" in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

D13-21. Figures 3F-7, 3F-9, and 3F-11 in Chapter 3F show that Delta Wetlands Project diversions would have minimal effects on the annual availability of optimal salinity habitat for striped bass, delta smelt, and longfin smelt. Discontinuing agricultural diversions and changing the timing of diversions under proposed project operations could increase the area of optimal salinity habitat for striped bass and delta smelt. The habitat area for longfin smelt would be reduced slightly. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", and response to Comment A7-3 for information on FOC terms that limit project effects on the X2 location.

D13-22. Delta Wetlands releases to outflow are limited by discharge capacity (about 6,000 cfs) and storage volume (238 TAF). Except when X2 is upstream of Suisun Bay (Delta outflow less than 28,000 cfs), Delta Wetlands discharges would be insufficient to move X2 a substantial distance downstream for any length of time. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for information about the operating restrictions specified in the FOC and biological opinion RPMs that reduce the potential project impacts to a less-than-significant level.

D13-23. The fish screens must meet the requirements specified by DFG, NMFS, and USFWS and described in the FOC and biological opinions. See responses to Comments B6-60 and B7-70.

D13-24. The commenter is referring to text that is part of Mitigation Measure F-5, which is proposed to reduce entrainment loss of juvenile striped bass and delta smelt. The potential entrainment effects of the proposed project have been reduced to a less-than-significant level by incorporation of the FOC and biological opinion RPMs into the proposed project. Therefore, this mitigation measure is no longer needed; however, the FOC and RPMs include similar requirements that Delta Wetlands provide for the conservation and replacement of habitat, allocate some water for environmental purposes, and provide funds for DFG to use for aquatic habitat restoration. DFG, NMFS, and USFWS would manage these resources. Habitat restoration activities would not be limited to the Delta Wetlands islands; the location and methods for habitat restoration would be determined by DFG, NMFS, and USFWS. Habitat restoration possibilities include stabilizing existing shallow-water habitat, converting deep-water habitat to shallow vegetated habitat, and converting existing agricultural lands to flooded tidal shallow-water habitat.

D13-25. See response to Comment C14-36.

D13-26. As it is discussed in the cumulative impact section on page 3F-35 of the 1995 DEIR/EIS (page 3F-39 of FEIS Volume 1), habitat refers primarily to structural features rather than to water quantity and quality (e.g., vegetated shallow-water areas and adjacent shaded riverine aquatic and riparian habitat).

D13-27. The X2 requirements of the 1995 WQCP would ensure that the existing February–June salinity distributions would be maintained (i.e., the existing freshwater boundary would be in a similar location) and freshwater habitat toward Suisun Bay would not be lost because of increased salinity intrusion. Restoration of agricultural lands in the Delta to tidal shallow-water habitat would increase the area of freshwater habitat available to fish species.

D13-28. The baseline for considering the impacts of the project under cumulative conditions is the existing no-project condition, which includes riprapped banks. Regulatory agency actions to improve Delta habitat are ongoing as part of CALFED, the Anadromous Fish Restoration Program (AFRP), and other programs described in the passage referred to by the commenter. When considered in combination with these actions, the temporary (construction-related) effects of the proposed project on habitat are less than significant. Also, the FOC and biological opinion RPMs now incorporated into the proposed project are designed to address the cumulative impacts of the proposed project, as well as the direct impacts. For details, see Master Response 4, “Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions”.

D13-29. See response to Comment D13-28.

D13-30. To describe how the effects of Delta Wetlands Project operations under cumulative future conditions would compare with those described for existing conditions, it was necessary first to describe how project operations would be expected to differ under the two conditions. The sentences quoted by the commenter establish the assumption that the project would divert less water under future cumulative conditions because a smaller increment would be available for diversion by Delta Wetlands within the established regulatory limits.

The last paragraph of the referenced section indicates the general meaning of this assumed reduction in diversions in terms of project impacts on fish; it states that the effect of project operations on fish under future cumulative conditions were expected to be similar to or less than the effects under existing conditions. However, most impacts were expected to remain significant under future cumulative conditions. The specific information requested by the commenter was provided; see the species-specific impacts under cumulative future conditions (Impacts F-19 through F-23) in Chapter 3F (pages 3F-41 and 3F-42 of FEIS Volume 1).

D13-31. The 1995 WQCP includes minimum outflow objectives to protect estuarine habitat. It also includes fixed flow objectives for the Sacramento and San Joaquin Rivers to ensure the provision of attraction and transport flows and suitable habitat for various aquatic species. Delta Wetlands Project operations would not affect compliance with the minimum-outflow objectives in the 1995 WQCP, and it would not affect inflow from the San Joaquin, Sacramento, or Mokelumne Rivers. As stated on page 3H-27 of the 1995 DEIR/EIS (page 3H-30 of Volume 1 of this FEIS), compliance with existing water quality objectives and other requirements would ensure that changes in Delta outflow do not cause salinity changes that would be detrimental to the management of wetlands for wildlife in the Bay-Delta area, including Suisun Marsh and San Francisco Bay. Chapters 3G and 3H identify the potential contribution of Delta Wetlands to cumulative habitat and wildlife impacts and identify mitigation measures that would reduce those impacts to less-than-significant levels. Additionally, the FOC and biological opinion RPMs incorporated into the proposed project are designed to address the cumulative impacts of the proposed project as well as the direct impacts; these include impacts on fish species and their habitats. For details, see Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions".

If the regulatory requirements for freshwater flows in the Bay-Delta were to be changed, Delta Wetlands' allowable diversions could be reduced.

D13-32. The FOC and biological opinion RPMs incorporated into the proposed project are designed to address all direct and cumulative impacts of the proposed project, including impacts on flows and habitat. For details, see Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions". See also response to Comment D13-22 above.

D13-33. The success of all habitat restoration actions is uncertain because of the current limited understanding of the relationship between habitat and the abundance and distribution of the fish population. The replacement ratio of 3:1 provides a margin of error in compensating for project impacts.

D13-34. See responses to Comments D13-11, D13-30, and D13-31.

D13-35. Acreage for each existing habitat type by project alternative is presented in Table 3G-4 in Chapter 3G, "Vegetation and Wetlands".

D13-36. Potential project impacts on special-status plant populations and associated mitigation measures are described in Chapter 3G of the 1995 DEIR/EIS, on page 3G-12 (page 3G-12 of FEIS Volume 1). The text on mitigation states that surveys will be conducted to locate special-status plant species populations before facilities are constructed; facilities will be sited to avoid impacts on identified populations; special-status plants will be protected from construction and recreational activities; and if special-status plants cannot be avoided, Delta Wetlands will develop and implement a mitigation plan that has been approved by the lead agencies and other resource agencies. See also responses to Comments D10-1 and D10-2 from the California Native Plant Society.

D13-37. All populations of special-status plant species on the Delta Wetlands Project islands were observed on the exterior levee slopes along Delta channels, so no known special-status plants would be affected by inundation of the Delta Wetlands Project islands. See Chapter 3G, Table 3G-2, and Figures 3G-1 through 3G-4.

D13-38. Most of the riparian woodland was established on Holland Tract and Webb Tract after flooding in 1980. These areas were surveyed in 1988 to establish the environmental baseline for the impact analysis. Therefore, most of the 203 acres of riparian woodland described in the 1995 DEIR/EIS were a maximum of 8 years old. Table 4 of the HMP (Appendix G3) describes the methods used to identify riparian woodland and scrub habitats acreage necessary to mitigate project impacts. Affected riparian woodland habitat would be replaced at a ratio of 3:1 and riparian scrub would be replaced at a ratio of 2:1. Acreage replacement ratios in excess of 1:1 would compensate for loss of habitat values during the period needed for mitigation habitats to develop.

D13-39. Alternative 3 represents the maximum water diversions under Delta Wetlands' water right application. Mitigation Measure G-4 requires offsite mitigation of impacts on jurisdictional wetlands because all four islands, except the portion of Bouldin Island north of SR 12, would be subject to inundation under Alternative 3. Alternative 3 is not the applicant's proposed project, and it is unlikely that this alternative would be permitted.

D13-40. Impacts G-4 and G-6 (loss of special-status plants) describe the potential for impacts on special-status plants resulting from siting of a pump station, siphon station, recreation facility, or other project facility on a site occupied by a special-status plant population. Implementation of Mitigation Measures G-2 and G-3 would reduce these potential impacts

to a less-than-significant level. See also responses to Comments D10-1, D10-2, and D13-36.

D13-41. Successful implementation of other habitat restoration or mitigation projects currently proposed for the Delta, in conjunction with the Delta Wetlands Project, would result in wetland and riparian habitats as described in Impact G-7 on pages 3G-15 and 3G-16 of the 1995 DEIR/EIS (page 3G-17 of FEIS Volume 1). The Delta Wetlands Project does not "take credit" for the efforts of other projects; however, the lead agencies must consider the cumulative effect (adverse or beneficial) of implementing the Delta Wetlands Project in conjunction with other past, present, and reasonably foreseeable future projects as required by NEPA and CEQA.

D13-42. See responses to Comments D13-11 and D13-31. The effect of changes in peak flows on fish and their habitat has been addressed through the federal and California ESA consultation process since the comment letter was written. The FOC and RPMs include limits on the timing and volume of Delta Wetlands Project diversions to minimize effects on the estuarine system.

D13-43. Chapter 3H includes a description of the significance criteria used in the analysis of impacts on wildlife resources. As stated in State CEQA Guidelines Section 15064(b), "an ironclad definition of significant effect is not possible because the significance of an activity may vary with the setting". The significance criterion cited by the commenter came from Appendix G of the State CEQA Guidelines, which listed examples of consequences that may be deemed to be a significant effect on the environment. This list was not inclusive and was used only for example purposes; Appendix G was removed from the State CEQA Guidelines in 1998.

D13-44. As indicated under "Use of HEP Results" on pages 3H-11 and 3H-12 of the 1995 DEIR/EIS (page 3H-13 of FEIS Volume 1), because future habitat conditions on the reservoir islands are uncertain, wildlife habitats developed on the reservoir islands would not be used to compensate for project impacts on wildlife.

D13-45. Implementation of the HMP would compensate for impacts on water birds and wading birds from operation of the reservoir islands. Impact H-2 on pages 3H-21 and 3H-22 of the 1995 DEIR/EIS (page 3H-23 of FEIS Volume 1) describes the net beneficial effect of the Delta Wetlands Project on nongame water and wading birds. As stated in the text, approximately 3,750 acres of additional wetland habitat would be created with implementation of the HMP.

D13-46. Neotropical songbirds that have been observed on project islands are listed in Table H2-4 of Appendix H2. Although neotropical songbirds are not specifically addressed in the HMP, implementation of the HMP would compensate for the loss of habitat used by neotropical migrants. Impact H-1 on page 3H-21 of the 1995 DEIR/EIS (page 3H-23 of FEIS Volume 1) describes the changes in upland habitats on the project islands that could be used by songbirds. As described in the HMP, approximately 732 acres of herbaceous

upland habitat, 387 acres of riparian habitat, and a total of 4,691 acres of agricultural habitat types would be provided on the habitat islands. These habitats could be used by neotropical migrants as well as other species addressed in the HMP. See Appendices G3 and G5 of the 1995 DEIR/EIS for more information about changes in habitats under the Delta Wetlands Project.

D13-47. See responses to Comments D13-45 and D13-46.

D13-48. See response to Comment A5-8. The methods used to determine the types and area of habitat mitigation necessary to offset project impacts on wildlife are described generally in Chapter 3H of the 1995 DEIR/EIS on pages 3H-11 and 3H-12 (page 3H-13 of FEIS Volume 1) and in detail in Appendix G3, "Habitat Management Plan for the Delta Wetlands Habitat Islands". The HMP requires that Delta Wetlands provide more acres of waterfowl habitat for mitigation than would be required if hunting was not permitted on the habitat islands or was permitted to occur at the existing, very low levels of hunter use. See also response to Comment D13-54 below regarding the effect of the airport on wildlife values.

D13-49. No mitigation credit is given for habitats created on the reservoir islands. See response to Comment D13-44.

D13-50. No mitigation credit is given for habitats created on the reservoir islands. See response to Comment D13-44. Compensation habitats for greater sandhill crane are described in the HMP (Appendix G3) in Table 4 and Figures 2 and 3.

D13-51. See response to Comment D13-46.

D13-52. The HMP (Appendix G3) describes management and development of compensation habitats for greater sandhill cranes. Table 4 describes habitats that would be used by cranes and Table 12 describes management strategies for managing foraging and roosting habitat. As indicated in Figures 2 and 3, potential roosting and foraging habitats would be in close proximity.

As described in response to Comment D13-38, mitigation habitat is created at a ratio greater than the amount lost to compensate for the time needed to establish the desired habitat values in replacement habitat.

D13-53. Mitigation Measure H-1 on page 3H-24 of the 1995 DEIR/EIS (page 3H-26 of FEIS Volume 1) describes mitigation required to offset potential impacts associated with project construction on special-status wildlife species. The second paragraph of the mitigation measure identifies avoidance of construction during sensitive periods of wildlife use as a potential mitigation measure.

D13-54. The potential impact of airstrip operations on greater sandhill cranes and wintering waterfowl is described in Impact H-16 on pages 3H-24 and 3H-25 of the 1995 DEIR/EIS

(page 3H-27 of FEIS Volume 1). The airstrip is an existing facility used for agricultural operations on Bouldin Island. The magnitude of effects of airstrip operations on the use of areas closed to hunting and other island habitats by greater sandhill cranes and other species is not known. Mitigation Measure H-2 requires monitoring of greater sandhill crane and waterfowl behavior in relation to airstrip use to identify adverse effects on these species. Use of the airstrip would be modified, as necessary, to avoid adverse impacts identified during monitoring. The commenter recommends relocating the airstrip from the closed hunting zone to a permitted hunting area as a mitigation measure for this potential impact. However, relocating the airstrip to a hunting zone could result in safety issues for aircraft operations and could displace other habitat. As indicated in the discussion of Mitigation Measure H-2, DFG and the HMAC may recommend various measures to reduce disturbance of sandhill cranes; these include closing the airstrip on hunting days. Alternatively, DFG and the HMAC could consider relocation of the airstrip if monitoring indicates that airstrip operations have an adverse effect on sandhill cranes.

D13-55. The effects of hunting on waterfowl distribution relative to the potential for disease outbreaks is described in Impact H-17 on pages 3H-25 and 3H-26 of the 1995 DEIR/EIS (pages 3H-27 and 3H-28 of the FEIS Volume 1). As indicated in the fourth full paragraph, large numbers of waterfowl could be expected to congregate in closed hunting zones on hunt days.

D13-56. The HMP (Appendix G3) describes hunter use restrictions in Table 19 and enforcement of the hunting program on pages 20 and 21.

D13-57. A discussion of passive nonconsumptive recreational uses of the Delta Wetlands Project islands is provided in Chapter 3J, "Recreation and Visual Resources", on page 3J-13 of the 1995 DEIR/EIS (page 3J-15 of FEIS Volume 1). Refer to the paragraph under the section "Other Recreational Uses". Impact J-5 on page 3J-15 (page 3J-17 of FEIS Volume 1) describes the beneficial effect that the Delta Wetlands Project would have by increasing private recreation use-days in the Delta for other recreational uses. Private nonconsumptive recreation use would be available year round on the Delta Wetlands Project islands, whereas hunting would only occur during the legal hunting season (fall and early winter).

D13-58. See responses to Comments A5-8, D13-48, and D13-54. Table 19 of the HMP (Appendix G3) describes restrictions on recreational uses on habitat islands to reduce impacts on wildlife.

D13-59. Potential impacts of the hunting program were incorporated into the modified habitat evaluation procedures (HEP) analysis conducted for HMP development. The analysis indicated that implementation of the HMP and the hunting program would ensure that waterfowl would use the habitat islands at levels that would offset project impacts on wintering waterfowl. Because the increased waterfowl mortality associated with hunting would be expected to be offset by increased duck production on the habitat islands, this impact is considered less than significant.

D13-60. Potential effects of changes in Delta outflow on wildlife and their habitats are described on pages 3H-27 and 3H-28 of the 1995 DEIR/EIS (page 3H-30 of FEIS Volume 1) under "Impact H-22: Potential Effects on Wildlife and Wildlife Habitats Resulting from Delta Outflow Changes". Certain assumptions were made in the 1995 DEIR/EIS about the adequacy of the 1995 WQCP for protection of fishery and wildlife resources; however, it is not within the scope of the analysis to determine the adequacy of existing water quality objectives and other requirements. See also responses to Comments A4-7 and D13-2.

D13-61. See Response to Comment D13-60.

D13-62. Establishment of riparian scrub habitat on habitat islands is described on page 10 of the HMP (Appendix G3). The second paragraph under "Riparian Scrub" states that riparian scrub may become established naturally in ditches, canals, and levee slopes. Stands of riparian species that become established voluntarily in these locations are not considered compensation for project impacts.

D13-63. HMP goals and objectives were prioritized based on the level of impact on existing wildlife uses. As indicated in Tables 17 and 18 of the HMP (Appendix G3), implementation of the HMP is expected to provide benefits for many other migratory bird species.

Compensation for impacts on the Swainson's hawk is described on page 2 of the HMP. As indicated in the first complete paragraph, all compensation for this species is provided on the habitat islands. See also response to Comment D13-44.

D13-64. The HMP text referred to by the commenter describes jurisdictional wetlands. The jurisdictional wetlands on the Delta Wetlands Project islands are defined under Section 404 of the Clean Water Act and were delineated by USACE and the NRCS. The habitat types on the Delta Wetlands Project islands that are considered jurisdictional wetlands include riparian woodland and scrub, freshwater marsh, exotic marsh, canals and ditches, permanent ponds, and other jurisdictional habitats. These "other" jurisdictional habitats include lands mapped as grain and seed crop, annual grassland and exotic perennial grassland, and developed lands delineated by the NRCS and USACE in 1994. See Appendix G5, "Summary of Jurisdictional Wetland Impacts and Mitigation", for more information on the delineation of jurisdictional wetlands on the Delta Wetlands Project islands.

D13-65. Procedures used to determine the acreage and quality of habitat types necessary to compensate for impacts are described on pages 3H-11 and 3H-12 in the 1995 DEIR/EIS (pages 3H-12 and 3H-13 of the FEIS Volume 1) under "HMP Development". Fewer acres of waterfowl habitat are necessary to compensate for a larger acreage of foraging habitat affected by the project because compensation habitats provide substantially greater waterfowl forage values on a per-acre basis than existing habitats. Refer to the HMP (Appendix G3) for more information.

D13-66. See response to Comment D13-52.

D13-67. Species goals and objectives for waterfowl breeding habitat on the habitat islands are described on pages 5–6 of the HMP (Appendix G3). As indicated under "Waterfowl Breeding Habitat", nesting boxes would be established on the habitat islands and not on the reservoir islands. See also response to Comment D7-1.

D13-68. Recreation on the habitat islands is described in the HMP (Appendix G3) and in Chapter 3J. Permissible recreation is described on pages 6–7 of the HMP and restrictions on recreation are described in Table 19. See response to Comment D13-57.

D13-69. Islands to be constructed in permanent lakes on Bouldin Island are described on page 11 and in Table 2 of the HMP (Appendix G3). Sizes of islands to be constructed were determined by the HMP team and are designed to provide high values for waterfowl and other species.

D13-70. Pages 11–13 of the HMP (Appendix G3) describe the process that would be used to ensure Delta Wetlands compliance with the HMP. As indicated in the first paragraph of this section, the chief of the SWRCB's Division of Water Rights maintains the ultimate responsibility for ensuring that Delta Wetlands implements the HMP in compliance with its water right permit. The preliminary HMAC organization is described in Table 22.

D13-71. The HMP (Appendix G3) identifies performance standards and goals for assessing the success of implementing the HMP (see page 17 of the HMP under "Performance Standards and Goals"). Performance standards are presented in Table 24 and performance goals are shown in Table 25. The performance standards are based on achieving compliance with the compensation management guidelines described in Table 2. Performance standards are not based on wildlife use levels because use levels can be affected by environmental and other factors outside the control of Delta Wetlands (e.g., periods of severe drought in waterfowl breeding areas could substantially reduce wintering waterfowl populations regardless of how waterfowl habitat is maintained on the islands).

D13-72. Recommended maintenance of emergent marshes on the habitat islands is described on page 20 and in Table 2 of the HMP (Appendix G3). As indicated in Table 2, a minimum of 30% emergent cover must remain after treatment to control dense stands of emergents to maintain open-water areas. As described on page 11 of the HMP under "Annual Operating Plans", Delta Wetlands would be required to submit a plan for agency and HMAC review before implementing measures to control vegetation in emergent marshes to ensure compatibility of treatment periods and methods with overall HMP goals and objectives.

D13-73. As described above, the chief of the SWRCB's Division of Water Rights maintains the ultimate responsibility for ensuring that Delta Wetlands implements the HMP in compliance with its water right permit.

D13-74. See responses to Comments D13-48 and D13-54.

CALIFORNIA **URBAN WATER** AGENCIES

December 21, 1995

California State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento CA 95812-2000
Attention: Jim Sutton

U.S. Army Corps of Engineers
Regulatory Branch
1325 J Street, 14th Floor
Sacramento CA 95814-2922
Attention: Jim Monroe

Subject: Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project (September 11, 1995)

Dear Mr. Sutton and Mr. Monroe:

The California Urban Water Agencies (CUWA) is an organization which represents eleven major water providers serving municipal and industrial water to over 20 million people with water diverted from the Sacramento-San Joaquin Delta or its tributaries. Our member agencies use about 90% of the urban water supplies taken from the Delta. As such, CUWA is vitally interested in any new projects in the Delta that might enhance the reliability of this water supply. At the same time, CUWA is concerned about any new projects that might degrade this quality of this water supply. Our members are presently involved in the California State Water Resources Control Board (SWRCB), CALFED and Central Valley Project Improvement Act implementation processes to improve water quality and habitat conditions in the Delta and its tributaries. This concerted effort is the result of the recent December 15, 1994 signing of the Principles for Agreement on Bay-Delta Water Quality Control Plan (WQCP) by the SWRCB.

This letter sets forth CUWA's comments to the September 11, 1995 Draft Environmental Impact Report and Environmental Impact Statement ("EIR/EIS") for the Delta Wetlands Project. The first part of the comments address project impacts and suggests additional mitigation measures. The second part describes uncertainties in the quantitative estimates of project impacts and addresses the need for additional and more detailed modeling.

455 CAPITOL MALL, #705, SACRAMENTO, CA 95814 916•552•2929 FAX 916•552•2931

Impacts of Delta Wetland Diversions

1. During diversion operations, the Delta Wetlands project will increase the salinity at Delta drinking water intakes by significantly reducing Delta outflow. Under the Alternatives 1 and 2, the maximum diversion rate to the two reservoir islands, Webb Tract and Bacon Island, could be as high as 9,000 cfs for up to 14 days. The operations studies reported in the Draft EIR/EIS suggest that these pumps might be turned on when the Delta outflow is as low as 10,000 cfs, resulting in a significant intrusion of ocean-derived salts. Figure 3C-18, for example, shows increases in chloride concentrations at the export pumps of about 50 mg/l. This will cause unacceptable impacts on municipal water supplies. In the case of the Contra Costa Water District (CCWD), this would also impair the operation and reduce the performance of the Los Vaqueros Project. **D14-1**

   The Delta Wetlands project should propose mitigation measures to avoid these significant impacts. For example, these could include allowing Delta Wetlands diversions to storage only if: (1) the 2 ppt isohaline is beyond a given location west of Chipps Island, and (2) provided a sufficiently protective salinity level at an interior location such as Jersey Point has been met for at least 7 days and continues to be met while water is diverted by Delta Wetlands. Thee requirements could be expressed in terms of specific conductance at Chipps Island and Jersey Point, and might be consistent with Delta outflows in excess of 20,000 cfs. Similarly, the combined pumping rate onto the reservoir islands could be limited to less than 9,000 cfs or even below 4,000 cfs, or allowable diversions could be a function of outflow.

2. The Delta Wetlands project may divert fish flows and other public trust flows released by other water agencies (e.g. the pulse flows required under the May 1995 Water Quality Control Plan and East Bay Municipal Utility District's (EBMUD) releases on the Mokelumne River). **D14-2**

   The project proponents should propose mitigation to avoid these significant impacts, for example, by limiting Delta Wetlands diversions when other agencies are making public trust releases related to fish passage to and through the Delta.

3. The Delta Wetlands project may divert water from the Delta during fish-sensitive periods when other water agencies are foregoing some or all diversions or altering their operations to provide fisheries benefits. The operations studies in the Draft EIR/EIS show Delta Wetlands monthly-average diversions in the March through May period to be as high as 3,800 cfs (Table A3-7a). During this period, other diversions are restricted for the protection of fisheries resources (for example, the SWRCB's May 1995 WQCP and **D14-3**

CCWD operating under its Los Vaqueros water rights permit). Delta Wetlands diversions during periods when other water users are restricted from diverting, or required to change their operations, may reduce these fisheries benefits. Project impacts on fisheries should be avoided. Delta Wetlands operations which detract from or reduce the benefits derived from limits on the operations of others should be avoided. **D14-3 cont'd**

The project proponents, as the most junior appropriator, should mitigate for these impacts by applying limits on Delta Wetlands diversions that are at least as restrictive as those imposed on other projects.

4. The Delta Wetlands project may cause significant fisheries impacts by changing flow patterns in the western Delta and by changing the salinity cues that are believed to direct fish passage through the Delta. Any impacts on fish abundance by Delta Wetlands could lead to more restrictive limits on the diversions and exports by CUWA member agencies, reducing their available water supply. **D14-4**

The project proponents should propose actions that mitigate these impacts, e.g. monitoring and fish transfer operations if found necessary.

Impacts of Delta Wetland Discharges

1. Storage of water on peat islands for extended periods of time will likely result in increased concentrations of organic carbon, algae, salinity and other contaminants. Release of this water could have unacceptable adverse effects on municipal water supplies, e.g. by causing increased production of trihalomethanes and haloacetic acids during the water treatment process. This impact must be avoided. The statement on page 2-1 that the project would increase the availability of "high quality water in the Delta for export" is not supported. **D14-5**

Water treatment or other means that ensure this does not significantly impact water utilities should be proposed, and the ability of the project to carry out the mitigation measures should be addressed. The Draft EIR/EIS needs to give more details of the procedures to limit discharges as needed (Mitigation Measure C-7).

2. There will be times when the salinity of the discharge from Delta Wetlands islands exceeds that of the receiving water. This will have the effect of degrading the Delta water supply. However, CUWA also recognizes that there will also be times when the salinity of the discharges may be lower than the receiving water The negative impacts of Delta Wetlands **D14-6**

discharges may not in all cases by fully mitigated by these improvements. The negative impacts should be avoided or mitigated.

The Delta Wetlands project should propose mitigation measures to avoid these adverse impacts. For example, these could include allowing Delta Wetlands diversions to storage only if the 2 ppt isohaline is beyond a given location west of Chipps Island, provided a sufficiently protective salinity level, at an interior location such as Jersey Point, has been met for at least 7 days and continues to be met while water is diverted. These requirements could be expressed in terms of specific conductance at Chipps Island and jersey Point, and might be consistent with Delta outflows in excess of 20,000 cfs. This mitigation measure will help ensure that only low salinity water is diverted onto the reservoir islands. Additionally, diversions could be limited to periods when the salinity was below a given threshold and discharges could be limited to periods when the discharge salinity is no more than a given amount above the salinity in the Delta channels. **D14-6 cont'd**

3. Discharges from Delta Wetlands islands into shallow channels, e.g. Sante Fe Cut, will cause increased turbidity in water diverted at Delta water supply intakes. **D14-7**

   This impact should be avoided, for example, by relocation of discharge points to deeper channels away from affected water supply intakes.

4. The Draft EIR/EIS also needs to consider an alternative that terminates or limits agricultural drainage from Delta Wetlands islands. This would help downstream municipal water facilities in meeting current and future drinking water standards. This alternative would be a No Project-No Intensive Agriculture alternative. **D14-8**

5. The project proponents should consider managing Delta Wetlands discharges by providing a direct piped connection between the reservoir islands and export locations. This may require choosing different islands as reservoir islands to reduce pipeline distances. From water quality considerations, islands with mineral soils would be preferable to peat soil islands for water storage. Such a piped connection would allow the option of direct connection to export locations or direct discharge to the delta, allowing delta water quality and export water quality to be more carefully managed. **D14-9**

Other Impacts

1. Seepage from the Delta Wetlands reservoir islands may affect the safety of the Mokelumne Aqueduct on Woodward Island and Orwood Tract. The project proponents **D14-10**

need to provide more detail regarding the seepage performance standards and the seepage control and monitoring system in these area. **D14-10 cont'd**

2. The effect of wind mixing in shallow wetland areas on Delta islands may be to increase the production of dissolved organic carbons. The project proponents should address this potential impact. **D14-11**

3. The Draft EIR/EIS needs to detail appropriate safeguards to protect urban water supplies from accidental spills and contamination from on-island marinas. Details regarding sanitary disposal and pump out facilities should be included. **D14-12**

4. The Draft EIR/EIS also needs to address cumulative effects of DWR's proposed Interim South Delta Plan and a fully mitigated Delta Wetlands project on the beneficial users of Delta water. **D14-13**

Methodological and Modeling Deficiencies

1. The Draft EIR/EIS analysis uses a Delta operations model (DeltaSOS) that does not have the ability to reoperate upstream reservoirs or account for changes in reservoir storage and demand south of the Delta. Without this information, the relationship between available export pumping capacity and the ability of Delta Wetlands to sell water south of the Delta is not clear. Similarly, the possible benefits of saving water in upstream reservoirs and discharging Delta Wetlands water for export instead are difficult to quantify. **D14-14**

   The modeling could be improved by incorporating a Delta Wetlands project node into a Central Valley operations model such as DWRSIM. This process would help ensure that changes in exports caused by Delta Wetlands operations are properly reflected in the reoperation of upstream and south-of-Delta reservoirs.

2. The Draft EIR/EIS treats CCWD's intakes and the SWP and CVP export pumps as a single south Delta point of diversion with the same water quality. In reality, the chlorides at the Rock Slough intake to the Contra Costa Canal can be significantly higher than export water quality during periods of seawater intrusion. Conversely, during periods of significant agricultural drainage from the San Joaquin Valley, the land-derived salts at the CVP's Tracy Pumping Plant may be significantly higher than at Rock Slough. For individual CUWA agencies to be able to assess the impact at their diversion points, it is important that a more detailed water quality model be used. **D14-15**

More detailed water quality results could be obtained by incorporating a Delta Wetlands operations algorithm into a validated Delta hydrodynamic and salinity model such as the Fischer Delta Model and operating the model over the full historical hydrologic period, 1922-1991. **D14-15 cont'd**

3. The Draft EIR/EIS uses a Delta hydrodynamic and salinity model to simulate historical water quality conditions that fails to adequately simulate water quality at the Rock Slough intake to the Contra Costa Canal. The data presented in Figure 3-C-13 of the Draft EIR/EIS shows substantial disagreement between simulated and measured data using the R.A. model, particularly during drought periods with salinity intrusion. The DeltaDWQ model also fails to adequately model Rock Slough chlorides, in particular during periods of agricultural drainage. **D14-16**

   The proponents need to use a validated Delta hydrodynamic and salinity model such as the Fischer Delta Model.

4. The methodology used in the Draft EIR/EIS to simulate water quality at the western Delta and at the export pumps does not appear to account for the time lag between salinity changes at these locations. The time lag between Jersey Point and Rock Slough for example is about 14 days, whereas the DeltaDWQ model produces simultaneous salinity changes at these two locations. **D14-17**

5. The analysis of the impacts of the Delta Wetlands Project on THM formation potential and impacts on total organic compounds (TOC) are underestimated with respect to future water quality standards. The impact of the project needs to be assessed relative to the 80 ug/1 TTHM MCL that takes effect in June 1996 and the 40 ug/1 MCL expected to be promulgated a few years later. Similarly, the Disinfectant Disinfection By-Products (D/DBP) Rule proposes MCLs for five specified haloacetic acids (HAA) which are not discussed or studies in the Draft EIR/EIS. Phase I of the D/DBP rule will introduce an MCL of 10 ug/1 for bromate. This also needs to be discussed in the Draft EIR/EIS. **D14-18**

   The project proponents need to compare the Delta Wetlands project THM, HAA, and TOC impacts against these new requirements.

6. The Draft EIR/EIS uses an older version of the Malcolm-Pirnie water treatment plant model to analyze THM production from Delta water. A new set of equations used in the new versions of the model was designed to compensate for the high bromide concentrations in Delta waters (page C5-6 of the Draft EIR/EIS). The project proponents need to compare the results of the old model with the new model to test the validity of the **D14-19**

assumption that recent model improvements are not expected to change the impact assessment results (see page C5-6). **D14-19 cont'd**

7. The thresholds used in the Draft EIR/EIS for chloride concentration changes at drinking water intakes are set too high. The 90% of maximum and 20% change criteria represent significant impacts on water quality and water supply. For example, a 20% change in a chloride concentration of 150 mg/l is a 30 mg/l increase. **D14-20**

8. The Draft EIR/EIS uses analyses which do not accurately reflect the likely mitigated operations of the project. The differences between the impacts of the proposed and mitigated projects are likely to be significant. **D14-21**

Conclusions

In summary, the Draft EIR/EIS is inadequate in a number of respects. The Draft EIR/EIS is legally required to contain a detailed mitigation monitoring plan to ensure identified mitigation can reduce adverse impacts to a level of insignificance. To do this mitigation measures must result in a project that does not significantly affect Delta water quality; that it does not impair the beneficial uses to which the water is put; that it does not adversely affect the users of Delta water; that it does not cause unacceptable adverse impacts on municipal and industrial water supplies; that it does not conflict with the operations of other water supply or water quality and reliability projects; and that it would not harm endangered and threatened species. The impacts to water quality and aquatic wildlife that have been identified in this letter need to be clearly demonstrated to be avoided, mitigated to a level of insignificance or identified as significant and unavoidable. **D14-22**

We appreciate your consideration of these comments and look forward to helping Delta Wetlands resolve issues of concern. If you have any questions, please contact me at (916) 552-2929.

Sincerely,

Byron M. Buck
Executive Director

BMB/RAD:ccg.348

cc: CUWA Member Agencies

Rick Woodard (DWR)
Terry Erlewine (SWC)
John Winther (Delta Wetlands)

California Urban Water Agencies

Comments in this letter often duplicate or are similar to comments received from the Contra Costa Water District (Comment Letter C9). Where appropriate, the commenter is referred to responses to those similar comments.

D14-1. See response to Comment C9-21.

D14-2. This comment duplicates Comment C9-23. See response to Comment C9-23.

D14-3. This comment duplicates Comment C9-22. See response to Comment C9-22.

D14-4. This comment duplicates Comment C9-24. See response to Comment C9-24.

D14-5. See response to Comment C9-25.

D14-6. See response to Comments C9-26.

D14-7. See response to Comment C9-27.

D14-8. See response to Comment C9-28.

D14-9. See response to Comment C9-29.

D14-10. See responses to Comments C6-1 and C6-2 from EBMUD regarding the safety of the Mokelumne Aqueduct.

D14-11. See response to Comment C9-32.

D14-12. See Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities". Delta Wetlands does not propose to provide pump-out facilities for boats because such facilities are available in the vicinity of the Delta Wetlands Project islands and other locations throughout the Delta, as shown in Figure 3E-4 of Chapter 3E, "Utilities and Highways".

D14-13. See responses to Comments C9-31 and B7-3.

D14-14. See response to Comment C9-10.

D14-15. See response to Comment C9-12.

D14-16. See response to Comment C9-13.

D14-17. See response to Comment C9-14.

D14-18. See response to Comment C9-15.

D14-19. See response to Comment C9-16.

D14-20. See response to Comment C9-17.

D14-21. See response to Comment C9-18.

D14-22. See response to Comment C9-56.

Section E. Individuals and Other Interested Parties

Letter E1

Rob Fletcher
1878 Catalina Ct.
Livermore, CA 94550
510-447-3643

10-18-95

Mr. Jim Sutton
California State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

Dear Mr. Sutton,

I am a landowner on Sherman Island and water issues in the Delta are of the utmost importance. Upon viewing the draft EIR/EIS for the Delta Wetlands project, this is the type of project that would seem to benefit everyone.

Storing surplus water during high flows and releasing it during low flows makes sense. Also, it should help reduce "reverse flows" caused by the State pumps during the critical dry months. E1-1

In addition, it will add shallow water wetlands in the Delta area for early arriving waterfowl, something that is currently unavailable in this area.

For the reasons I am supporting the Delta Wetlands' project and look forward to its approval.

Sincerely,

Rob Fletcher

Rob Fletcher

E1-1. The lead agencies acknowledge this comment supporting the project. Because this letter does not specifically comment on the environmental analysis in the 1995 DEIR/EIS, no response is required.

Letter E2

George C. "Tim" Wilson
P.O. Box 248
Walnut Grove, CA 95690

October 20, 1995

Mr. Jim Sutton
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812-2000

Dear Mr. Sutton:

I have reviewed the Deir/Eis for the Delta wetlands project. It would appear that the project would reduce the threat of flooding on the four islands because of the larger levees. Subsidence would stop on the portions that remain under water. I would expect long term benefits to the Delta if this project is completed. E2-1

Sincerely,

George C. "Tim" Wilson
Trustee
Reclamation District No. 563 - Tyler Island
Reclamation District No. 556 - Upper Andrus Island
Reclamation District No. 554 - Walnut Grove Tract
Reclamation District No. 2111 - Dead Horse Island

GCW:lme

George C. "Tim" Wilson

E2-1. The lead agencies acknowledge this comment supporting the project. The effects of strengthening the Delta Wetlands Project island levees and operating the reservoir islands are discussed in Chapter 3D, "Flood Control". Because this letter does not specifically comment on the environmental analysis in the 1995 DEIR/EIS, no response is required.

Letter E3

Daniel M. Wilson
P.O. Box 248
Walnut Grove, CA 95690

October 20, 1995

Mr. Jim Sutton
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812-2000

Dear Mr. Sutton:

Your Delta Wetlands project has many positive aspects for the Delta. It is apparent that it will enhance water storage and wildlife. The fact that this is compatible with local farming operations is also important.

More importantly, I feel this project will bring a new land use to the Delta. This brings an economic diversity that help the local communities survive the swings in agricultural prices. In addition, it should improve land prices in the long term. E3-1

I would like pass along my support for your project. It will be of great to the Delta.

Sincerely:

Daniel Wilson

RD 2111
Riverside Elevators
Kay Dix

Daniel M. Wilson

E3-1. The lead agencies acknowledge this comment supporting the project. Because this letter does not specifically comment on the environmental analysis in the 1995 DEIR/EIS, no response is required.

Letter E4

ELLIS ISLAND FARMS, INC.
QUIMBY ISLAND - RECLAMATION DISTRICT NO. 2090

22 BATTERY STREET, SUITE 800
SAN FRANCISCO, CALIFORNIA 94111
TELEPHONE (415) 391-5034

October 26, 1995

Mr. Jim Sutton
California State Water Resources Control Board
Division of Water Rights
P. O. Box 2000
Sacramento, California 95812-2000

Re: Comments on Draft EIR/EIS, Delta Wetlands Project

Dear Mr. Sutton:

I have briefly reviewed the Draft Environmental Impact Report for the Delta Wetlands Project and would like to make the following comments:

1. The deep peat soils of the Delta, especially in the central western Delta, face a limited future in farming and it makes sense to convert those islands to wetlands or reservoirs in order to ensure their permanence on a sound economic bases. **E4-1**

2. The project proponent appears to be pursuing an aggressive seepage control program, which I wholeheartedly endorse.

3. The wetland enhancement aspects of the project appear to be producing significant benefits which will be welcomed. The most important impact, the possibility of waterfowl disease, can be addressed by changing the management of the habitat islands to allow light hunting over the entire island without closed zones. The closed zone contemplated on Holland Tract may have a significant adverse impact on Quimby Island. Opening the closed zone to hunting is an appropriate mitigation for the possibility of having a breakout of waterfowl diseases. **E4-2**

I urge you to process the water right application at the earliest possible date so that this project can be brought on-line as soon as possible.

Thank you for considering these comments.

Sincerely,

Ellis M. "Steve" Stephens
Owner, Quimby Island
Trustee, Reclamation District No. 2090

Ellis M. "Steve" Stephens (Ellis Island Farms, Inc.)

E4-1. The effects of subsidence on Delta islands and the proposed seepage control program for the Delta Wetlands Project are described in Chapter 3D, "Flood Control". Because this comment does not specifically address the environmental analysis in the 1995 DEIR/EIS, no response is required.

E4-2. The commenter is concerned that establishing areas closed to hunting would increase the risk of outbreaks of botulism and avian cholera. Hunting or hazing in closed hunting zones is not precluded as a potential management action, but such a change in habitat island management would have to be justified. See response to Comment D7-3.

D& L Farms
P.O. Box 620
Linden, California 95236
Telephone: (209) 887-2538

Letter E5

November 1, 1995

California State Water Resources
Control Board
P.O. Box 2000
Sacramento, California 95812-2000

ATTENTION: Jim Sutton

RE: DELTA WETLANDS PROJECT

Dear Mr. Sutton:

As a tenant farmer of a portion of Bacon Island, I wanted to write and express my feelings regarding the proposal of Delta Wetlands to store water on two delta islands, including Bacon Island.

Obviously, if the project is approved I will be forced to seek other farm ground in the delta, or an alternative means of support. While I personally do not look forward to either scenario, I feel that the proposed project would be beneficial to the overall health and longevity of the entire delta, as well as agricultural interests located in that region--and it should be approved. E5-1

Bacon Island has a limited life as a viable farm ground. I have come to this realization after my observation of the eroding away of surface peat soil, which leaves a combination of soil types at the surface or near it. The existance of this condition has increased on an ongoing basis and makes farming of that particular ground more difficult and less productive as time passes. Farming practices and techniques for peat ground are not compatible with farming techniques and practices for mineral or other types of soil; and, consequently, the combination of soils at the surface will eventually render Bacon Island unfarmable. This eroding is known as "land subsidence" and the Soil Conservation Service estimates it occurs at a rate of about 1 to 4 inches per year. I personally became familiar with Bacon Island, Camp 6 ranch, in 1977 when I started farming it, and it is my opinion that the subsidence may have been more than four inches per year on that particular ground, because, as I mentioned, I have observed a drastic change in the composition of soil near its surface since 1977.

Another reason I support the project is that it ensures the future health of the delta levees surrounding the islands involved. As I mentioned, if this project becomes a reality, it is my intent to seek other farm ground in the delta to lease. It would be in my interests to have a strong levee system on not only the island I would be directly based upon, but all delta islands, as this would prevent the "domino effect" of flooding and weakening of neighboring levees which I am sure you are familiar with. It is no secret that the economics of farming fluctuate drastically. I am concerned that during those "lean" times, farming may not generate enough revenue to maintain the levees at a level that would prevent deterioration. Collection of reclamation assessments could become directly affected since farming generates the revenue that the reclamation assessees rely on to pay the assessments. It is my belief that by diversifying the use of ground within the delta system, an element would then exist in the process that would provide a degree of insulation to the reclamation districts during the "hard times of farming." **E5-2**

Regarding the issue of a decrease in productive farmground should the project be approved; I remind you of the existance of government programs which require a grower to take a portion of land out of production in order to receive crop subsidies. I do not believe these programs resulted in any type of shortage of food to the American public. On the contrary, we still enjoy vast surpluses and an abundance of the same crops as before the government "set aside land" programs came into effect. **E5-3**

In summary, I feel that the benefits resulting from the implementation of the proposed project would far outweigh any adverse impact generated by it; and it is my hope that it becomes a reality. If you have any questions, concerns or comments regarding the topics I have addressed or any other relating to the proposal, please do not hesitate to give me a call at (209) 887-2538.

Sincerely,

Leisha Robertson

Leisha Robertson
D & L FARMS

Leisha Robertson (D & L Farms)

E5-1. The commenter's observations about soil subsidence on Bacon Island are consistent with the discussions in the 1995 DEIR/EIS (see Chapters 2, "Delta Wetlands Project Alternatives"; 3D, "Flood Control"; and 3I, "Land Use and Agriculture" of the 1995 DEIR/EIS and Volume 1 of this FEIS).

E5-2. Chapter 3D, "Flood Control", describes the potential benefits of strengthening the Delta Wetlands Project island levees and changes in levee funding on the Delta Wetlands Project islands. Chapter 3K, "Economic Conditions and Effects", discusses the economic and fiscal effects of the Delta Wetlands Project. As noted by the commenter, implementing Alternative 1, 2, or 3 would diversify the land use and economy of the Delta area.

E5-3. Regardless of the effects of federal land set-aside programs on food availability or prices, the conversion of agricultural land on the Delta Wetlands Project islands would represent the loss of a productive natural resource. Chapter 3I fully describes the quality of the farmlands on the Delta Wetlands Project islands and the effects of converting these farmlands to nonagricultural use.

KYSER SHIMASAKI
4412 MALLARD CREEK CIRCLE
STOCKTON, CA 95207

NOVEMBER 20, 1995

MR. JIM CANADAY
DIVISION OF WATER QUALITY AND WATER RIGHTS
STATE WATER RESOURCES CONTROL BOARD
PO BOX 2000
SACRAMENTO, CA 95812-2000

DEAR MR. CANADAY:

I AM TAKING THIS OPPORTUNITY TO RESPOND TO THE DRAFT ENVIRONMENTAL IMPACT REPORT PREPARED FOR THE DELTA WETLANDS PROJECT. MY COMMENTS WILL BE BRIEF BECAUSE I BELIEVE THAT THE DOCUMENT IS VERY THOROUGH IN ITS ANALYSIS.

1. OUR FAMILY HAS BEEN FARMING IN THE SAN JOAQUIN DELTA . BACON ISLAND IN PARTICULAR. AS TENANT FARMERS SINCE 1918, SHORTLY AFTER IT WAS RECLAIMED AND AS LANDOWNER FARMERS SINCE 1974.

2. OVER THE PAST 39 YEARS THAT I HAVE PERSONALLY BEEN INVOLVED IN FARMING ON BACON ISLAND, I HAVE OBSERVED THE CUMULATIVE SUB-SIDENCE OF THE LAND AND IT IS BECOMING A SERIOUS THREAT TO THE INTEGRITY OF THE LEVEES. UNTIL APPROXIMATELY TEN YEARS AGO, 90% OF BACON ISLAND'S SURFACE WAS PEAT SOIL AND HIGH INCOME CROPS JUSTIFIED RECLAMATION ASSESSMENTS TO IMPROVE AND MAINTAIN THE LEVEES SURROUNDING BACON ISLAND. PRESENTLY, WE ON BACON ISLAND, SIMILARLY WITH OTHER FARMERS IN THE DELTA, ARE CONSTANTLY STRUGGLING TO FIND A NEW PROFITABLE CROP TO JUSTIFY MORE REVENUES TO BUTTRESS OUR LEVEES. **E6-1**

3. WE HAVE MADE A GOOD LIVING FROM FARMING, BUT HAVE SEEN SIGNS THAT THE LAND CANNOT BE FARMED FOREVER IN THE MANNER THAT WE ARE USED TO. PARTS OF THE RANCH ARE NOW TOO WET TO MANAGE AS FARM LANDS. THE LEVEES HAVE BECOME INCREASINGLY TALL AND EXPENSIVE TO MAINTAIN. THE RISK OF A FLOODED ISLAND FROM A LEVEE BREACH INCREASES EVERY YEAR. I THINK THAT THE ENVIRONMENTAL IMPACT REPORT IS CORRECT IN INDICATING THAT THE RESERVOIR AND WETLAND CONDITIONS CREATED BY THE PROJECT WOULD ARREST SUBSIDENCE AND INSURE A ,LONG AND USEFUL LIFE FOR THE LAND.

E6-1 cont'd

4. I THINK IF THE FOUR ISLANDS IN THE PROJECT ARE CONVERTED TO INTENSIVE FARMING THAT THEY WILL PROBABLY NOT FARM AS MUCH ASPARAGUS AS THEY ARE PRESENTLY SHOWING, BUT WILL RATHER GO TO SPECIALTY CROPS WHICH ARE CAPITAL INTENSIVE RATHER THAN LABOR INTENSIVE.

IT IS NOT EASY FOR ME TO SEE THE LAND THAT MY FAMILY HAS FARMED FOR SO MANY YEARS GO OUT OF AGRICULTURE PRODUCTION, BUT THE REALITY OF IT IS THAT THE COMBINATION OF WATER STORAGE AND WETLANDS CREATION IS AN ECONOMICALLY FEASIBLE WAY OF RETURNING THE LAND BACK TO A MORE NATURAL STATE BEFORE MOTHER NATURE HERSELF RECLAIMS THE ISLANDS WITHOUT ECONOMIC OR ENVIRONMENTAL BENEFIT.

THANK YOU FOR CONSIDERING THESE COMMENTS.

SINCERELY.

Kyser Shimasaki

KYSER SHIMASAKI

Kyser Shimasaki

E6-1. The commenter's observations about soil subsidence and levee funding on Bacon Island are consistent with the discussions in the 1995 DEIR/EIS (see Chapters 2, "Delta Wetlands Project Alternatives"; 3D, "Flood Control"; and 3I, "Land Use and Agriculture" of the 1995 DEIR/EIS and Volume 1 of the FEIS). Because this letter does not specifically comment on the environmental analysis in the 1995 DEIR/EIS, no response is required.

Letter E7

November 29, 1995

To: Mr. Jim Sutton
State Water Resources and Control Board
P.O. Box 2000
Sacramento, CA 95812-2000

From: Earl Cooley, Manager
Medford Island Habitat Conservation Area
#1 Medford Island
Stockton, CA 95219

Re: Comments to draft E.I.R. and H.M.P. for Delta Wetlands Project

Dear Mr. Sutton:

My first concern is that, as I understand it, over 1400 acres of wildlife habitat will be closed to all waterfowl hunting. Typically, large "closed zones" concentrate migratory waterfowl in such densities that avian botulism and cholera can spread to thousands of birds very rapidly. Even the managers of State and Federal refuges have enough flexibility to allow hunters into "closed zones" at times to distribute birds to minimize disease outbreaks.

Secondly, areas around such "closed zones" may receive intensive use by feeding waterfowl at night, but not during shooting hours. While this appears to be in the best interests of the resource, consider the many landowners who flood their harvested grain fields for waterfowl hunting. Many will convert to more profitable truck crops with little habitat value when hunter success decreases because of the "closed zone" requirement. E7-1

Another option for consideration is consolidation of the proposed "closed zones" and free-roam areas into low-impact management units which could allow for the rotation of closure area as necessary so birds are not confined to one specific area after it has been feed out or disease outbreaks have occurred.

"In kind" replacement has been the conceptual objective of mitigation. The closure of hunting on 1400 acres of wetlands in the central Delta will not maintain outside hunting property values, current flyway patterns or minimize waterfowl disease mortalities. However, the wise use of low impact zones with minimal hunter densities could help address the aforementioned concerns.

Sincerely,

Earl W Cooley

E.W. Cooley

EWC/jyt

Earl W. Cooley (Medford Island Habitat Conservation Area)

E7-1. The commenter is concerned that establishing areas closed to hunting would increase the risk of outbreaks of botulism and avian cholera and would change wildlife use patterns on other islands in the Delta. The effects of hunting on waterfowl distribution relative to the potential for disease outbreaks are described under Impact H-17 in Chapter 3H, "Wildlife". The potential change in waterfowl use patterns on other Delta islands is addressed by Impact H-21. The establishment of closed hunting zones on the habitat islands is described on pages 3H-19 and 3H-20 of the 1995 DEIR/EIS (see pages 3H-21 and 3H-22 of FEIS Volume 1). As described in the HMP (Appendix G3), the HMAC may approve future changes to the management of the habitat islands, including the hunting program, but the monitoring data would have to justify such changes before the changes could be approved. Hunting or hazing in zones closed to hunting is not precluded as a potential management action to control waterfowl disease outbreaks, but such a change in habitat island management would have to be justified. See also response to Comment D7-3.

December 10, 1995

State Water Resources Control Board
Division of Water Rights
Attn: Jim Canaday
P.O. Box 2000
Sacramento, Ca. 95812-2000

Dear Mr. Canaday,

My wife and I attended the public hearing on the Delta Wetlands Project October 11. We enjoyed talking to you, and appreciate your sending us a full copy of the Draft EIR/EIS.

We passed it around to interested neighbors on Bradford Island, and held a study session on November 11. As the nearest island to Webb Tract, we all had our concerns about the effect turning Webb into a reservoir would have on our property and lifestyle.

I was asked to submit our concerns and comments to you, for inclusion and response in the final EIR/EIS.

1. Financial Arrangements for the Jersey, Bradford, Webb Tract Ferry

Page 2 of chapter 3-L states that the ferry is currently funded in equal part by Contra Costa County, Webb Tract Reclamation District, and Bradford Reclamation District. However, Contra Costa County no longer provides funds for the E8-1

ferry, according to Mike Walford, Director of Public Works. The June, 1995 ferry budget shows a County contribution of $16,000, while the reclamation districts paid $98,400.

The figures in the EIR/EIS on ferry usage are from 1991-92, and are lower than current usage. The report also estimates 40 trips daily for the ferry, which is impossible during the normal nine hour day.

E8-1 cont'd

Both the ferry and the road are currently underfunded and in need of maintenance. Any decline in ferry service would make farming, working, or living on Bradford Island untenable.

We would like written assurance in the EIR/EIS that Webb will continue to fund the ferry at least its current rate, and we would like the facts about ferry service updated and corrected. We would also like to have a maintenance agreement for the Jersey Island Road in place.

2. Boating Traffic and Safety

Webb Tract is bordered by three major boating navigation channels; False River, Fisherman's Cut, and the San Joaquin River. Though the San Joaquin is too broad to be effected by the Delta Wetlands project, the increased traffic and (especially) the proliferation of restricted speed zones on the other two channels would be have very significant negative impact on waterway traffic and safety.

E8-2

Chapter 3L assumes all boating traffic in the region to be recreational, but this is not the case. Fisherman's Cut

and False River are commonly used to move large barges, tugs, cranes and other equipment. Dutra Construction Company, Mid-Cal Construction and others use these channels almost daily. Residents of Bradford also commute to work, shop, etc. using these channels as their "freeway". The Coast Guard and Sheriff's Water Patrol of Contra Costa and San Joaquin Counties use these waterways as the fastest route from the San Joaquin and Sacramento Rivers to Franks' Tract, Bethel Island, and Discovery Bay.

E8-2 cont'd

None of these activities could continue if the six proposed recreational facilities on these waterways required 5 mph zones. We believe the EIR/EIS needs to address the professional, residential, and commercial boating traffic problems.

Perhaps some of these recreational facilities should be built with wake barriers, or seawalls, so that the speed zones would not be necessary. Perhaps they should be relocated. Definitely, more thought should be given to this problem.

3. Meteorological Changes

The report mentions an increase in tule fog conditions, and cites this as a negative impact on traffic across Bouldin Island. No mention is made, nor research cited, about the increase in fog around the other project islands, nor of its effects on marine navigation.

E8-3

Wind and wave action complement each other. As the open

expanse of water increases, so does the ferocity of both. Sailors call this phenomena "Fetch". Some of us fear that flooding the islands will increase the fetch, resulting in much more turbulence on adjacent channels. This could make navigation more dangerous, and erode the levees of adjacent islands. E8-3 cont'd

We would like more information on both fetch and fog included in the final EIR/EIS.

4. Groundwater Seepage; Groundwater Quality

Figure 3D-3 shows the location of piezometers to monitor seepage that changes the groundwater table on islands adjacent to the reservoir islands. Delta Wetlands proposes to install and begin monitoring these piezometers one year before the first filling of the islands.

Because groundwater levels change annually as well as seasonally, we would like them installed and monitored sooner, so an accurate baseline could be established. E8-4

Unusual fluctuations in the water table could disturb contaminants and pollute well water. It would be inexpensive to test well water on islands near the project before starting, and periodically thereafter. This would reassure residents that their water was safe.

5. Escrow Account

In our conversation October 12, you mentioned the possibility of requiring an escrow account to be set aside to insure that funds would be available if something went wrong. E8-5

We think this is a good idea, and would like to see some particulars included in the EIR/EIS. **E8-5 cont'd**

We are not opposed to this project, just concerned. When your neighbor says he plans to put 300 elephants in his back yard, you have to ask where all the elephant crap will go. Thank you for letting us ask these questions.

Sincerely,

Paul and Liza Allen
4 Bradford Island
Stockton, Ca. 95219
510/684-9328

Paul and Liza Allen

E8-1. The information on the funding of the Delta Ferry Authority has been updated based on input from Contra Costa County. See response to Comment C13-6 above.

The reference to the number of "trips" in Chapter 3L refers to the number of passenger trips on the ferry in a day, not to the number of trips that the ferry took in a day. The text of the second paragraph under "Webb Tract" on page 3L-2 of the 1995 DEIR/EIS (page 3L-3 of the FEIS) has been revised to update the data on ferry use, correct the reference to daily average passenger use, and update the information on funding of the Delta Ferry Authority as follows:

> The Delta Ferry Authority operates the Jersey-Bradford-Webb ferry each hour from 8:00 a.m. to 5:00 p.m., Monday through Friday during fall, winter, and spring, and Friday through Tuesday during summer. During fiscal year ~~1991-1992~~1998–1999, the total number of passengers using the ferry was ~~10,440~~21,938 (California Office of the Controller ~~1993~~2000). Based on this figure, average use for that year is estimated to have been approximately ~~40~~85 passenger trips per day. ~~The ferry system is funded through a resolution involving Contra Costa County, Webb Tract Reclamation District, and the Bradford Island Reclamation District, with each participant bearing one-third of the cost.~~ The ferry system is funded through the Delta Ferry Authority. The Delta Ferry Authority is composed of Contra Costa County, Webb Tract Reclamation District, and Bradford Reclamation District. Each reclamation district provides approximately $50,000 per year in funding for the ferry service (Heringer pers. comm.), while Contra Costa County collects approximately $15,000 per year in local funds to support the ferry service (Cutler pers. comm.). The Delta Ferry Authority collects these monies to fund operation of the ferry.

The following citations have been added to Chapter 3L:

Cutler, Jim. Assistant director, Comprehensive Planning. Contra Costa County Community Development Department, Martinez, CA. December 21, 1995—letter to Jim Monroe, U.S. Army Corps of Engineers, commenting on the 1995 Draft Environmental Impact Report/Environmental Impact Statement for the Delta Wetlands Project.

Heringer, Ralph. Operations. Delta Ferry Authority (Bouldin Farming Company), Contra Costa County, CA. February 27, 1996—telephone conversation with Amanda Brodie of Jones & Stokes.

California Office of the Controller. 2000. Financial transactions concerning transit operators and non-transit claimants under the Transportation Development Act. (Annual Report 1998–1999.) Sacramento, CA.

Delta Wetlands and Bradford Island have a mutual need for the use of the ferry system, and funding for this service would not be affected by implementation of the Delta Wetlands Project. The projected traffic volumes for recreational use of the Delta Wetlands Project islands indicate that the amount of ferry service to Webb Tract would be greater after project implementation than it is now. The text in Chapter 3E has been updated to reflect the traffic analysis. See responses to Comments C13-6 and C16-1. The commenter's concerns about the maintenance of Jersey Island Road are addressed in response to comment letter C16 from Reclamation District No. 830 and in the section entitled "Roadway Safety and Maintenance" in Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

E8-2. Boating traffic and safety were discussed generally on page 3L-3 in Chapter 3L, "Traffic and Navigation", of the 1995 DEIR/EIS. The commenter notes that Delta channels are used for commercial activities and transit in addition to recreation. To reflect this information, the following text has been added to the end of the first paragraph under "Waterway Traffic and Safety" (see page 3L-4 in FEIS Volume 1).

> Boating traffic in the Delta also includes commercial, residential, and emergency service traffic. Fisherman's Cut and False River, for example, are used to transport large barges, tugs, cranes, and other types of equipment. Bradford Island residents use the channels as a "freeway" to commute to work and to shopping locations. Police and fire services also use the waterways for emergency response to various locations in the Delta.

Increased boat traffic and speed restrictions under the Delta Wetlands Project would affect residential and commercial traffic as well as recreation traffic. The increase in boat traffic and congestion is considered a significant and unavoidable impact, as described under Impact L-7 in the 1995 DEIR/EIS. See also Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

E8-3. The commenter is concerned about the effects of the proposed water storage operations on fog and wind fetch conditions in channels adjacent to the Delta Wetlands reservoir islands. Fog conditions in the channel waters outside the Delta Wetlands water storage areas or in other parts of the Delta would not be affected by the increased fog on the Delta Wetlands Project islands. As described in the 1995 DEIR/EIS, storage of water on the Delta Wetlands reservoir islands could create localized fog conditions on those islands. Fog can settle low on bodies of water when there is little or no wind, and these conditions can create a dense fog over that body of water. Heavy fog over Delta channels is an existing condition, and because winds are characteristically calm on days of heavy fog, fog on the Delta Wetlands Project islands would not substantially affect conditions in the adjacent channels. Under Alternative 3, SR 12 may be subject to heavier fog than under existing conditions where it passes through the proposed water storage area; therefore, fog conditions and traffic hazards on SR 12 on Bouldin Island are discussed on page 3E-13 under "Highway Safety" in Chapter 3E, "Utilities and Highways", of the 1995 DEIR/EIS (FEIS page 3E-14). Chapter 3E has been revised to include a discussion of fog conditions

on the waterways around the proposed project islands. The following text has been added as the last paragraph under "Waterway Traffic and Safety" on page 3L-4 of the 1995 DEIR/EIS (pages 3L-4 and 3L-5 of FEIS Volume 1):

> Fog is common during the winter months throughout the Delta. Fog may sometimes settle low on bodies of water (i.e., Delta channels) when there is little or no wind, creating a dense fog condition in that localized area. Marine navigation in the Delta can be difficult during periods of dense fog. However, according to the U.S. Coast Guard, the level of boating activity and the need for search and rescue efforts during the winter months is relatively low compared with the need in summer months (Undieme pers. comm.). Boaters who use the Delta in the winter are generally experienced in boating, carry navigational equipment, and are familiar with marine navigation in foggy weather (Undieme pers. comm.).

Also, the following text has been added under "Navigation" on page 3 L-11 of the 1995 DEIR/EIS (page 3L-13 of the FEIS):

> Water storage on the Delta Wetlands reservoir islands could increase fog on the project islands during the winter months but would not substantially affect existing fog conditions in the adjacent channel waters or in other parts of the Delta (Bohnak pers. comm.). Therefore, increased fog on the Delta Wetlands reservoir islands would not affect boater navigation in adjacent channels.

The following citations have been added to Chapter 3L:

Bohnak, Steve. Sargeant. San Joaquin County Sheriff's Department, Boating and Marine Safety, San Joaquin County, CA. February 29, 1996—telephone conversation with Amanda Brodie of Jones & Stokes.

Undieme, Daniel. Petty Officer. U.S. Coast Guard, Rio Vista Station, Stockton, CA. February 29, 1996—telephone conversation with Amanda Brodie of Jones & Stokes.

Waves and fetch in the adjacent channels would remain the same under the Delta Wetlands Project as under existing conditions. Fetch is the distance traveled by waves in open water from their point of origin to the point where they break. As the fetch increases, the waves produced become larger. The fetch across the Delta Wetlands reservoir islands under extreme wind conditions would produce substantial waves on the reservoir islands (see Appendix H of the 2000 REIR/EIS). However, waves produced on the Delta Wetlands islands would break at the islands' perimeter levees. Therefore, adjacent channels would not be affected by waves generated by wind on the Delta Wetlands islands, and the exterior slopes of adjacent island levees would not experience erosional effects from waves generated across the Delta Wetlands reservoir islands.

E8-4. Delta Wetlands continuously monitored groundwater levels on several Delta islands for more than 5 years. See Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS for a more detailed analysis of the seepage monitoring and control system.

The Delta Wetlands Project would not cause unusual fluctuations in groundwater levels that could affect water quality in wells. Delta Wetlands would be required to monitor and mitigate substantial changes in groundwater levels attributable to the Delta Wetlands reservoir island operations. Additionally, well owners are currently required to regularly test the well water that they use for domestic consumption, so additional testing by Delta Wetlands would not be necessary.

E8-5. Provision of an escrow account or liability line of credit is outside the scope of the NEPA and CEQA analysis.

Delta Wetlands and EBMUD submitted a protest dismissal agreement to the SWRCB during the water right hearing. The agreement requires that Delta Wetlands maintain escrow accounts to fund annual operating expenses and corrective actions as necessary to address problems attributable to Delta Wetlands reservoir operations.

Date 12/18/95
122 Castle Crest Rd.
Walnut Creek, CA. 94595

STATE WATER RESOURCES CONTROL BOARD
DIVISION OF WATER RIGHTS
ATTENTION: JIM SUTTON
P. O. Box 2000
SACRAMENTO, CA 95812-2000

Re: Environmental Impact Report/Environmental Statement for The Delta Wetlands Project: Water Right Applications 29061, 29062, 29063, 29066, and 30267, 30268, 30269, 30270: My Comments on the EIR/EIS for the DELTA WETLANDS PROJECT, WATER RIGHT APPLICATIONS

My comments will be directed toward the wildlife and habitat of all four Delta Islands affected by this project. My expertise primarily stems from some fifteen years of wildlife management on Webb Track Island. I have an additional thirty plus years of recreational experience on three of the four islands in this project as well as the general Delta Region.

The fertility and diverse habitat complete with riparian "fresh" water rights are the key to developing the property to its "highest and best use". The "highest and best use" is maximizing the islands for wildlife via mitigation banking in conjunction with compatible agriculture. The Delta Wetlands Project can facilitate this goal within the Delta region and mitigate the adverse impacts of the project to no net loss. However this will only occur with some significant changes to the projects proposed "ALTERNATIVES 1 AND 2", mitigation measures proposed for Bouldin Island and Holland Tract Island.

Comments

1. The EIR does not adequately place potential nesting values on Delta Wetlands Project's habitat islands, found in "ALTERNATIVES 1 and 2". This could be easily rectified in "ALTERNATIVES 1 and 2" by including more aggressive mitigation measures for the nesting needs and habitat values required by the Mallard, Gadwall, Teal, Wood Duck, Short-eard Owl, Marsh Hawk, and Ringneck Pheasant. Establishing the following habitat and nesting needs mosaics for the above species will also more then provide for other Delta indigenous species. Implementing the following recommendations Delta Wetlands Project could be an exemplary model for future Delta mitigation projects by: E9-1

a. Increasing "brood / pair water". The total amount of these waters should be at least 10% of the total land mass of each of the habitat islands.

b. The brood / pair waters should be meandering and interconnecting, with sufficient emergent plant growth as to reduce predation of broods.

c. Seasonally drying of the brood waters will increase the growth of insects needed for brood food sources. The needed hydrology for the seasonal drying of ponds will require sophisticated water management systems in order to accommodate adjacent required winter flooding for the Pacific Flyway migrations of waterfowl and related species.

e. Corn / wheat acreage on the two habitat islands should only exist if irrigation can be provided in other then the traditional use of spud ditches. Spud ditches turn croplands into killing fields for ground nesting birds' fledglings and some young mammals. Unless spud ditches can be redesigned to allow fledglings to escape the spud ditches fatal entrapments. Irrigation should be provided by other means, such as the use of shallow walled "V" ditching. **E9-1 cont'd**

e. On going habitat management of the two habitat islands is imperative. Pro-active management of habitat is necessary in order to implement and maintain maximized wildlife diversities, density per acre in conjunction with increased brood survival. Theses are needed for true mitigation of this project.

2. As part of the mitigation measures, annual research funding is to be provided by the project. I recommend the following areas for research:

a. Research and written findings of land nesting species their diversity, their density, and most importantly the nesting survival rate should be conducted to determine validity of habitat management successes. This research should occur for the first 3 to 5 years of the project. The nesting studies conducted by the Dept. of Fish & Game and the California Waterfowl Association at Grizzly Island Wildlife Area, should be used as a minimum base line when considering the nesting value and potential of the four Project Islands, with emphasis placed on the two habitat islands.

b. Research and written findings of carrying capacity and use of Pacific Flyway migrating waterfowl should also be completed to determine validity of habitat management successes, during the first three to five years of the project. **E9-2**

c. Research and written findings of other food values incidental to agricultural crops such as corn and wheat (i.e root fibers, grasses, insects etc.) need to be identified, and valued as to each species in their overall wintering needs as compared to native none crop habitat such as water grass and smartweed etc. This research should be conducted by collecting waterfowl craw samples to empirically determine the actual foods being consumed by waterfowl during their use of DW Project Islands. The research should be conducted during the first three years of project operations. These studies are necessary to bring about resolution concerning effective waterfowl food values of DW Project mitigation measures.

3. The continued planting of corn and wheat crops, should stop as soon as managed native habitat can biologically demonstrate the capability of providing appropriate biota carrying capacity for Delta indigenous and migratory species. **E9-3**

4. The Highway 12 corridor running through Bouldin Island should be bordered longitudinally by trees and or vegetation. This barrier should be of sufficient height as to provide a visual and to some degree sound barrier between highway and the wetland / wildlife habitat. This barrier is essential to the maximization of the valuable mitigation acreage of Bouldin Island. E9-4

5. All project islands will have to be carefully monitored for out breaks of wildlife diseases such as cholera and botulism, which can have devastating impacts on wildlife. E9-5

6. Mitigation for wildlife values lost by the projects reservior islands and the maximization of potential wildlife values of the two habitat islands within the Delta Wetland project should be the primary focus of this project's mitigation efforts. While threatened and endangered species are of great concern, they should not be the preoccupation or even the primary focus of the overall wildlife potential of these two Delta islands. E9-6

7. The overall management of the Delta Wetland habitat islands must be flexible in order to respond rapidly to unexpected occurrence both in nature or man made impacts. E9-7

8. Waterfowling recreational opportunities of this project are significant. The key to any truly "Quality" waterfowling is management. The proposed imposition of "Closed Zones" is counterproductive to quality wetland management and quality waterfowling recreation. Quality waterfowling is self limiting by its very nature. The impact of quality hunting is only an incidental intrusion to wetlands. Management of hunter density and quality wetlands habitat is the true measure of the wetlands carrying capacity, species diversity, density and yield of the biota in question. Closed zones will add to potential spread of wildlife diseases due to unnatural concentration of wildlife. Closed zones will detract from the Delta's overall waterfowl distribution and concentrations, thus reducing current waterfowling recreational opportunities as well as having a negative effect on neighbors. E9-8

PROJECTS BENEFITS

1. Given the implementation of above suggestion, in conjunction with proposed project mitigation habitat plan, other Delta indigenous species as well as a potentially exemplary wetlands management program not presently found in the Delta.

2. In the winter months, having an increased amount of ponding available could relieve the current cholera outbreak problems. By having two Project Islands watered, and two wetland managed islands the large concentrations of birds competing for limited amounts of spaces and water could be avoided. E9-9

3. This project would provide additional recreational and hunting opportunities within the Delta area.

4. Increase the availability of water for consumptive users.

5. Preventing the suburbanization of the Project Delta Islands.

6. Decrease island subsidence.

7. Water diversions from the Delta-San Francisco Bay estuaries should occur under the projects proposed "ALTERNATIVES 1 and 2" and not under projects "ALTERNATIVE 3".

8. The project will generate needed research funds and important findings as to the effectiveness of the mitigation measures of this project as well as future Delta mitigation projects.

E9-9 cont'd

CLOSING COMMENTS

This project's EIR has clearly been a monumental effort and has been years in the development. The Delta Wetlands Project has the opportunity to provide an exemplary model for both nesting as well as wintering habitat for Delta indigenous species. By implementing the two Habitat Island's Wetland Plan, the diversity, breadth and distribution of varying ecological systems and their extremely important edge zones, will be valued as a ecological gestalt interrelating to adjacent environmental demands.

Clearly this project will significantly change the historic land uses of these Delta Islands. This change will be from agriculture with significant wildlife values to seasonally water storage with wildlife values and two potentially exemplary wetlands management programs. This project should conduct and publish results of habitat planning as well as the result of any studies completed regarding wildlife and wetland management. The Delta Wetland mitigation results will greatly benefit other potential Delta wetland mitigation projects in the future.

Respectfully submitted,

Peter Margiotta

Peter Margiotta
Concerned about the Delta

CC: Gayle Bishop, Supervisor
Contra Costa County Board of Supervisors

Peter Margiotta

E9-1. The commenter states that the HMP does not include adequate nesting habitat and value on the habitat islands for waterfowl and other species. The commenter specifically recommends that the HMP address nesting needs and habitat values for the mallard, gadwall, teal, wood duck, short-eared owl, marsh hawk, and ringneck pheasant.

Project impacts on waterfowl and nesting bird species are described in Chapter 3H, "Wildlife", of the 1995 DEIR/EIS (see pages 3H-21 to 3H-28 [pages 3H-23 to 3H-30 of FEIS Volume 1). As described in the 1995 DEIR/EIS, the HMP would increase breeding habitat for a substantial number of species, including waterfowl and other nesting birds. In DFG's species evaluation of the proposed Delta Wetlands Project (Comment B6-71), the department found that the Delta Wetlands Project would fully mitigate effects on mallard, gadwall, teal, wood duck, and short-eared owl and would provide ancillary benefits to the short-eared owl and wood duck. DFG notes that effects on the ring-necked pheasant would occur but would be less than significant. This finding is consistent with the 1995 DEIR/EIS, which acknowledges that there would be a net loss in acreage of upland habitat for ringneck pheasant. However, implementation of the HMP would partially offset these impacts by creating fewer, but higher quality, upland habitats.

The commenter's recommended changes to the HMP are not required to offset impacts of the proposed Delta Wetlands Project. Development of waterfowl breeding habitat is described on pages 5–6 and in Table 2 of the HMP (Appendix G3) and includes management of brood ponds and nesting cover. As described in Table 2 of the HMP (Appendix G3), Delta Wetlands is committed to modifying spud ditches to reduce the likelihood of duckling mortality caused by entrapment in ditches (see response to Comment D7-2). Also, as noted in response to Comment A5-8, the HMP can be amended to change habitat types and management practices in future years if monitoring data indicate that such changes would continue to meet the goals of the HMP.

E9-2. The Delta Wetlands environmental research fund would contribute to research in the Delta. As described on page 2-9 of the 1995 DEIR/EIS (page 2-11 of FEIS Volume 1), the allocation of the fund would be under the direction of Delta Wetlands and a research committee. The committee would be composed of representatives of DFG, USFWS, NMFS, the SWRCB, Delta Wetlands, fishery-oriented and waterfowl-oriented organizations, and one general environmental organization. The commenter's suggestions for research projects have been noted and would be considered by the research committee during project implementation. It should be noted, however, that the environmental research fund would not be used to monitor HMP success or to fulfill project permit or operation requirements (see response to Comment C13-19). Mitigation monitoring is required as part of the project to determine whether mitigation habitats are providing the wildlife values intended by the HMP (see Appendix G3, pages 21-22 and Table 26).

E9-3. Changes in future management of the habitat islands, including cropping patterns, may be permitted with justification as described under "Management Monitoring Programs and Performance Standards" on pages 21–22 of the HMP (Appendix G3).

E9-4. Although some riparian vegetation would be established adjacent to SR 12, the HMP design team did not consider creation of a corridor of riparian vegetation along the entire length of the highway on Bouldin Island because such a corridor may impede movement of waterfowl and other wildlife between habitats north and south of the highway.

E9-5. The Delta Wetlands Project islands would be monitored for outbreaks of botulism or other waterfowl diseases, as described on page 3H-26 of the 1995 DEIR/EIS (page 3H-28 of FEIS Volume 1). See also response to Comment D7-3.

E9-6. Analysis and mitigation of project effects on federally listed and state-listed species are required by the federal and state Endangered Species Acts. The primary goals for habitat island management are to offset significant project impacts on state-listed threatened species (no federally listed species would be affected by the project), wintering waterfowl foraging habitat, and jurisdictional wetlands (see page 3H-19 of the 1995 DEIR/EIS [page 3H-21 of FEIS Volume 1]). As described in Chapter 3H, implementing the HMP would offset the loss of wildlife values caused by reservoir operations.

E9-7. Successful implementation of the HMP requires flexibility in management of the habitat islands. Protocols for allowing changes in management under specified conditions are described in the HMP (Appendix G3) on pages 11–16 and pages 21–22.

E9-8. The effects of areas closed to hunting on botulism and avian cholera outbreaks and on neighboring islands are addressed in responses to Comments D7-3 and E7-1.

E9-9. The Delta Wetlands Project would result in beneficial impacts as stated by the commenter and identified in the 1995 DEIR/EIS.

Letter E10

Robert C. & Jean M. Benson
10331 Norwich Avenue
Cupertino, CA 95014
(408)253-0388

December 18, 1995

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Jim Monroe
1325 J Street, Room 1444
Sacramento, CA 95814-2922

RE: Comments on Draft Environmental Impact Report and Environmental Impact Statement For the Delta Wetlands Project.

Gentlemen:

Robert C or Jean M. Benson (hereinafter referred to as Benson) filed its Protest to Applications 29061, 29062, 29063, and 29066 of Bedford Properties to appropriate from various rivers, sloughs, cuts, and channels of the San Joaquin River Delta at points on Bouldin Island, Webb Island, Holland Island, and Bacon Island.

Benson is a Landowner on Bradford Island engaged in agriculture.

Bradford Island is located immediately west of Webb Tract (one of the reservoir islands within the Project) across Fisherman's Cut. On the north and west for Bradford Island is the San Joaquin River, the main ship channel to the Port of Stockton.

Access to Bradford Island is only by boat. R.D. #2059, in conjuction with Contra Costa County and Reclamation District No. 2026 (Webb Tract), operates the Delta Ferry Authority which provides ferry service from Jersey Point to Bradford Island and Webb Tract.

Benson filed Protests to the Applications of Bedford Properties, now Delta Wetlands, for the operation of the Project as described in the Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project, dated September 11, 1995 (herein referred to as the "Report and Statement").

Benson makes the following comments and expresses the following concerns to the Report and Statement as it relates to Bradford Island:

I.
BOAT TRAFFIC

In the Summary (page S-3), Project Alternative describe Alternatives 1 and 2 as including the following:

> "Portions of the habitat islands and the reservoir islands would support recreational activities. Up to 38 private recreation facilities may be located on the perimeter levees of all four islands. These recreation facilities, with up to 40 bedrooms each, will include boat docks in adjacent channels, with 30 boat berths, and boat docks on the island interiors, with up to 36 boat berths, that may be operated year round."

In reviewing the impact of such a project, your attention is drawn to Chapter 3L, and in particular to Impact L-7 on page 3L-12:

> "**Impact L-7: Increase in Boat Traffic and Congestion on Delta Waterways during DW Project Operation.** Implementation of Alternative 1 would result in the addition of 1,116 boat trips on a peak summer day to waterways in the DW project vicinity. Based on estimated recreation use it is estimated that boat trips would increase by approximately 5% over existing conditions. Also, construction of the recreation facilities would restrict boat speeds on up to approximately 8 miles of Delta waterways. Restricted speeds, combined with boats moving into and out of waterways at the DW facilities, would create boat congestion on days of heavy recreational use. Therefore, <u>this impact is considered significant and unavoidable</u>." (emphasis added)
>
> "**Mitigation.** No mitigation is available to reduce this impact.

This Report accepts the fact that the addition of the recreational facilities described in the Summary above, and that no mitigation is available to reduce this impact.

Reclamation Districts have long contended that one of the greatest impacts on its levees is boat traffic. As the number of boats increase, and the size and speed of those boats also increase, the surrounding levees are negatively impacted. E10-1

Reclamation Districts find that boat traffic in the channels surrounding their levees impacts the Districts in the following ways:

1. The wave wash from boat wakes cause the levees to erode and the levee riprap to slip into the water leaving the levees exposed to further erosion.

2. The cost of repairing levees and replacing levee material is continually increasing when monetary resources are declining.

3. Reclamation Districts are restricted in making repairs to its levees without providing substantial wildlife mitigation and habitat at very costly expenditures to the District.

4. Some levees are constructed of peat and/or sand material and are therefore very fragile. Increased boat traffic is particularly harmful to such levees. E10-1 cont'd

Bradford Reclamation District No. 2059 is one of those districts which have fragile levees and very limited funds with which to maintain its levees. To permit the additional recreational uses described in the Summary and concluding that it will have a significant but unavoidable impact is unacceptable.

Who is going to assist R.D. #2059 in the added costs of maintaining its levees, both in replacing the washed-away materials and the significant financial impact to the District in meeting all of the habitat mitigation requirements placed upon it in order to restore the eroded levees?

Benson respectfully suggests that this Report and Statement does not adequately address the impact of increased boat traffic on the levees of neighboring islands as any impact on the Reclamation District will impact Benson's cost by way of increased assessments.

II.
SEEPAGE

It must be recognized that if Webb Tract is flooded, it will result in increased seepage on adjoining islands, and in particular on Bradford Island. This is a fact, for in 1980 when Webb Tract flooded, that very thing occurred on Bradford Island.

This is recognized in the Report and Statement in Chapter 3D on page 3D-13, where it is stated:

> "An engineering model (SEEP) was used by HLA (1989) to analyze seepage potential of water storage on Webb Tract across Fishermans Cut to Bradford Island. This location was identified as being particularly sensitive because of the short seepage distance across Fishermans Cut. Fixed hydraulic levels were tested under a range of permeability

conditions of soil materials to determine the effect of flooding and exposed borrow pit excavation. The model indicated that both hydraulic heads and seepage levels in sands on Bradford Island would increase as a result of flooding of Webb Tract. This analysis assumed a water storage elevation of +4 feet based on a previous project description; however, the currently proposed water storage level of +6 feet would not alter the results of the study (Tillis pers. comm.). Seepage levels would still increase on Bradford Island as a result of the proposed +6 feet water storage under Alternative 1." (emphasis added)

So the question is not "if there will be seepage" but rather how much seepage and what can be done to protect Bradford Island.

This Report and statement suggests that the appropriate mitigation efforts is that of installing a Seepage Interceptor Will System Along the Western side of Webb Tract and piezometers along the eastern side of Bradford Island. There is no established basis for determining that such a mitigation effort will be adequate to prevent seepage onto Bradford Island. E10-2

The Report and Statement also provides on page 3D-10 other potential mitigation efforts for controlling seepage including (1) existing levees on neighboring islands; (2) constructing toe berms with an internal drainage system on neighboring islands; (3) lowering the design pool elevation on the DW reservoir islands; (4) developing wetland easements adjacent to levees on neighboring islands; (5) purchasing farmlands affected by increased seepage; (6) constructing a combination of seep and interior ditches and increasing pumping rates; (7) installing clay blankets; and (8) installing impervious cutoff walls through project island levees.

The fact that so many different and varied alternatives are suggested as a means of mitigating the effect of seepage is an indication that they recognize that there is no simple answer to the problem.

Seepage will have a major impact on Bradford Island. Too much water will not only weaken the District's levees and substantially increase the District's expenses required to maintain and operate its drainage facilities, but will also be detrimental to the agricultural crops and livestock on Bradford Island. E10-3

R.D. #2059 knows that if Webb Tract is flooded that Bradford Island will find itself faced with an unsurmountable burden - the burden of establishing proof that the seepage on Bradford Island is caused by the flooding of Webb Tract. E10-4

Engineers will tell you that water seepage from point A to point B is not the same as following a pipe between two points. E10-5

Water and the resulting hydraulic head can translate through many layers and strata of earth and come up some distance from the point from which it entered. Seepage resulting from the flooding of Webb Tract will not only affect the land on Bradford Island immediately adjacent to Fishermans Cut, but could also affect land anywhere within Bradford Island. As a result it would be nearly impossible to solve the problem of seepage on Bradford Island with interceptor wells, relief wells, toe berms, clay blankets, or impervious cutoff walls through the levees. Many of the proposed mitigation efforts would require the construction or installation of mitigating devices to or near the levees of R.D. #2059 or the taking of private property on Bradford Island. E10-5 cont'd

E10-6

As a landowner any additional costs to the District will be passed on to us by way of assessments. Also after the 1980 Webb Tract flooding, Bensons property did have seepage problems from Webb Tract.

In conclusion, Benson does not want and should not be put in the position of having to prove that increased seepage is in fact coming from the flooding of Webb Tract in order to protect their property rights. The Project should not be approved without substantial and proven mitigation measures that will provide adequate protection to Bradford Island from seepage.

III.
INCREASE SALINITY

The Report and Statement acknowledges that the Project will result in the increase of salinity at Jersey Point.

The life and financial success of Bradford Island is based upon the growth of crops, hay and pasture supporting livestock and each of these require a supply of good quality of Water. Increases of salinity in the water surrounding Bradford Island will have a negative impact upon those items.

Bradford Island sits precariously between the salt water of the Suisun Bay on the west and the fresh water of the Sacramento-San Joaquin Delta on the east. It is recognized that if a substantial amount of fresh water is taken out of the channels upstream from Bradford Island - such as Webb Tract and Bacon Island - the slat water on the western side of Bradford Island will move further and further upstream. E10-7

Any operation of the Project must contain foolproof measures to protect the supply of good quality water for Bradford Island.

Benson depends on Agriculture on Bradford Island and any increase in salinity will affect income.

III.
CONCLUSION

The Report and Statement not only do not adequately address the impact of this Project on Bradford Island, but it is entirely silent on how problems are to be resolved. There is no foolproof method of guaranteeing that Benson will have any recourse to protect ourselves without protracted and costly litigation, during which the adverse effects will continue unabated. The Report and Statement should include a definitive dispute resolution process that will protect the adjoining landowners pending the outcome of that process. E10-8

The burden of proof and all costs to and damages of Benson created by the Project must not be borne by Benson.

Benson respectfully request that the Report and Statement must not be approved without substantial and proven mitigation measures for addressing the concerns raised in this letter.

Your very truly,

BRADFORD RECLAMATION DISTRICT
NO. 2059

By Robert C. Benson
Robert C. Benson

By Jean M. Benson
Jean M. Benson

Robert C. and Jean M. Benson

This comment letter is identical to Comment Letter C7 from Bradford Reclamation District No. 2059. As indicated below, see responses to Comment Letter C7 for responses to the following comments.

E10-1. See response to Comment C7-1.

E10-2. See response to Comment C7-2.

E10-3. See response to Comment C7-3.

E10-4. See response to Comment C7-4.

E10-5. See response to Comment C7-5.

E10-6. See response to Comment C7-6.

E10-7. See response to Comment C7-7.

E10-8. See response to Comment C7-8.

CALIFORNIA-OREGON
TRANSMISSION PROJECT

P.O. Box 15140, Sacramento, CA 95851-5140 (916) 852-1273

December 19, 1995

California State Water
Resources Control Board
Division of Water Rights
Attn: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

Subject: Comments on the Delta Wetlands Draft EIR/EIS
Provided by the California-Oregon Transmission Project

Dear Mr. Sutton:

The California-Oregon Transmission Project (COTP) has an established waterfowl mitigation site on Palm Tract "B." Palm Tract "B" is located on a delta island directly west of Bacon Island and directly south of Holland Tract in Contra Costa County (see attached map). As project manager of the COTP, the Transmission Agency of Northern California (TANC) owns Palm Tract "B" and manages the 1,213 acre waterfowl mitigation site. As an adjacent landowner, TANC and the COTP mitigation site, have the potential to be impacted by the proposed Delta Wetlands Project. We have reviewed the September 1995 Delta Wetlands Project Draft Environmental Impact Report and Environmental Impact Statement (Draft EIR/EIS), and have comments on the environmental analysis. The purpose of this letter is to provide our formal comments for consideration in the Final EIR/EIS.

The COTP mitigation site was identified, and a site specific waterfowl habitat mitigation plan adopted, on April 23, 1993 as acknowledged in the Interagency Agreement among TANC, the United States Department of Energy (acting through the Western Area Power Administration), the United States Department of the Interior (acting through the Fish and Wildlife Service), and the California Department of Fish and Game. The Interagency Agreement provides the formal framework for continuing cooperation among the parties in the implementation of Section 9.0 of the COTP Waterfowl Mitigation Plan (February 1992). The final COTP EIS/EIR was issued in January 1988 (DOE/EIS-0128 and State Clearinghouse number 85040914).

Palm Tract "B" was acquired for COTP waterfowl mitigation purposes on July 2, 1993; implementation of the COTP Waterfowl Habitat Management Plan began at that time.

The Department of Fish and Game accepted a grant of conservation easement on the property on September 29, 1994. TANC's management goals on Palm Tract "B" are to provide waterfowl habitat, produce waterfowl, and at the same time sustain an economically viable farming operation. The Final EIR/EIS must evaluate the proposed project's potential to impact the COTP mitigation project. This land use was not identified in either the Land Use and Agriculture Section (3I) or in the Wildlife Section (3H) of the Draft EIR/EIS. As a consequence, certain potential impacts were not addressed. Provided below are our formal comments.

Wildlife

The Draft EIR/EIS evaluation of the proposed project's impact to existing and anticipated wildlife resources (pg 3H-10, HEP Analysis and Methodology) does not address the existing COTP mitigation site. The Draft EIR/EIS does not clearly identify impacts of the proposed project on the COTP site. Please provide information on the draft HEP report conclusions on Delta Wetlands project modifications (e.g., the development of recreational facilities and land uses) to habitat suitability on Palm Tract "B." We are especially interested in the impact of project recreational development on habitat suitability (e.g., brood pond use) on Palm Tract "B." **E11-1**

Impact H-17 (page 3H-25) identifies the potential for increased incidence of waterfowl disease. TANC agrees that the potential for outbreaks of avian cholera and botulism present a potentially significant impact to waterfowl. The Draft EIR/EIS does not address the potentially significant impacts that an outbreak of these diseases would have on the waterfowl using the adjacent COTP waterfowl management site. The management strategies included in the proposed mitigation measure (H-3) do not address the need to integrate management strategies with those currently being used on Palm Tract "B." The Draft EIR/EIS must provide information on the relationship between the management of the existing COTP mitigation area and the proposed project. We look forward to working with Delta Wetlands project proponents to define mutually-acceptable management practices to optimize our separate and common wildlife management efforts. **E11-2**

Trespass and Depredation of Wildlife Resources

The Delta Wetlands hunting program would be private and is anticipated to increase hunting use by 13 - 21 percent. The potential for trespass onto adjacent islands as a result of the Delta Wetlands hunting program and the projected increases in hunting is not addressed. Since the implementation of the COTP Waterfowl Habitat Management Plan, we have experienced problems with trespass hunting and poaching. The impact of the proposed project on trespass and poaching on the COTP mitigation area and the two wildlife islands, including the identification of mitigation measures such as security patrols, must be addressed in the Final EIR/EIS. **E11-3**

Hydrology and Water Use

In regard to water rights, water seepage into levee foundations and farmland, and the potential for reservoir island levee failure, we share the concerns of Reclamation District 2036 as noted in its original protest to the State Water Resources Control Board filed on **E11-4**

January 19, 1988 and amended by letter dated September 29, 1993. These concerns include the following issues: that the proposed increased period of diversion would increase the potential for conflict with existing water right holders; that increased reservoir storage would increase the threat of overtopping of reservoir levees; and that the potential for seepage into adjacent farmland could negatively impact farming operations and increase water pumping costs. The Draft EIR/EIS does not address potential impacts to adjacent properties, only channels. We do not agree that implementation of the project would result in a "less than significant" impact. The Final EIR/EIS must address the potential impacts that proposed project water use would have on adjacent properties. **E11-4 cont'd**

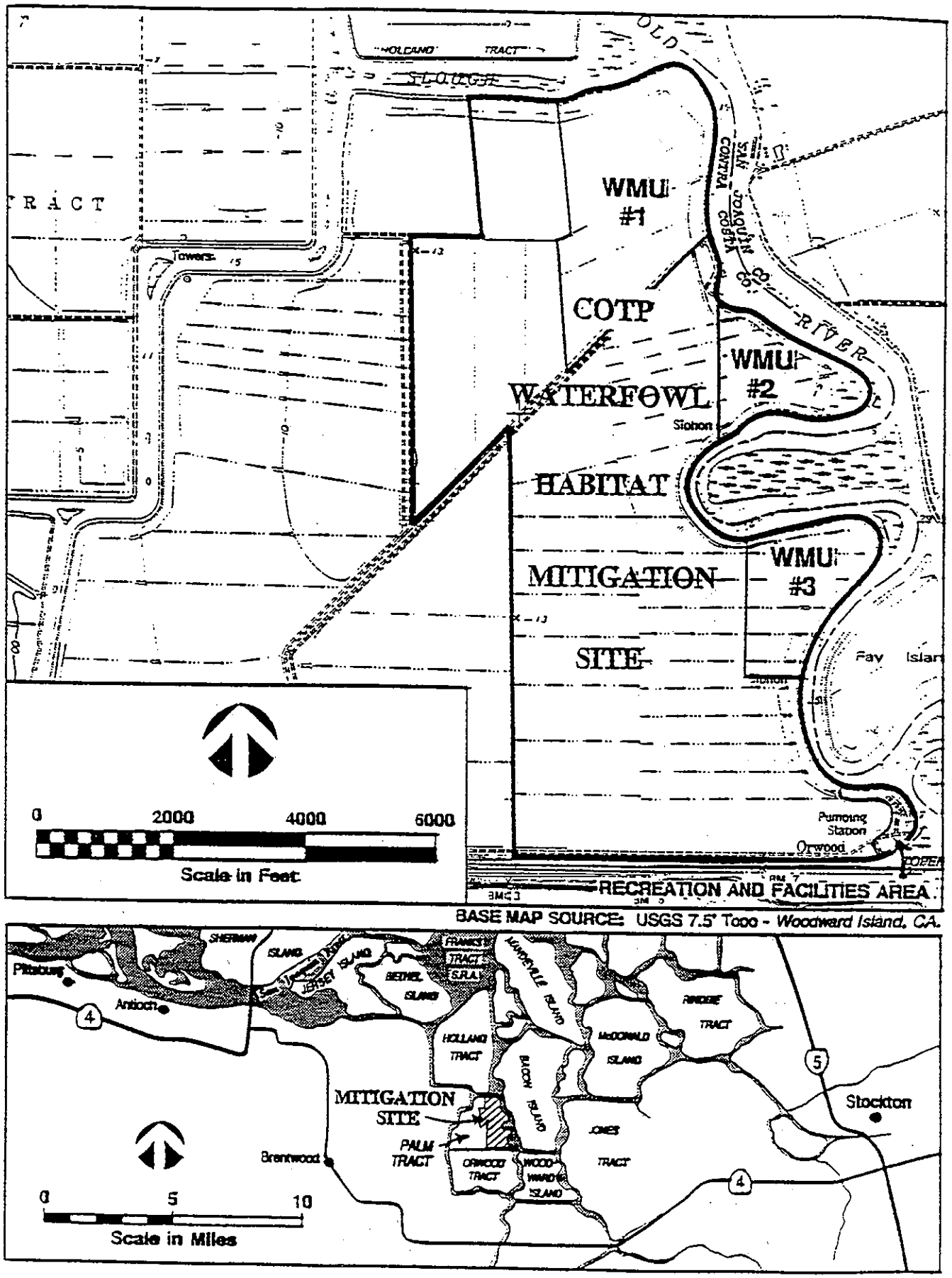
If you have any questions regarding these comments, please contact me or Raquel Zachman at the above telephone number and address. We look forward to seeing these comments addressed in the Final EIR/EIS.

Sincerely,

J. Lynn Rasband

J. Lynn Rasband
Agency Representative

cc: Mr. Doug and Ron Morris, Palm Tract Farms
Mr. Dante John Nomellini, Reclamation District 2036 secretary and counsel
Mr. Al Jahns, COTP Counsel



COTP
Waterfowl Habitat
Management Plan

FIGURE 1

VICINITY AND SITE MAP

California-Oregon Transmission Project

E11-1. The commenter states that the 1995 DEIR/EIS does not clearly identify impacts of the Delta Wetlands Project on the California-Oregon Transmission Project (COTP) mitigation site and requests information from the HEP analysis conducted for the Delta Wetlands Project to identify these impacts.

The Delta Wetlands Project could indirectly affect the COTP mitigation site because of changes in the Delta Wetlands island habitat conditions, or it could contribute to cumulative changes in the project area. These impacts are already identified in Chapter 3H and include the potential for increased incidence of waterfowl diseases, potential changes in local and regional waterfowl use patterns, and cumulative changes in foraging habitat for wintering waterfowl and herbaceous habitats in the Delta.

The HEP analysis conducted to evaluate existing wildlife habitat values and values anticipated to be created with implementation of earlier versions of the Delta Wetlands Project is described on pages 3H-10 and 3H-11 of the 1995 DEIR/EIS (pages 3H-11 and 3H-12 of FEIS Volume 1). The purpose of a HEP analysis is to assess the direct impacts of the Delta Wetlands Project on wildlife communities on the project islands. The HEP procedure compares the quality and acreages of habitats under pre-project and project conditions to determine changes in total habitat value on the project site. Therefore, the HEP results would not provide the commenter with additional information about the effects of the Delta Wetlands Project on the COTP mitigation site.

E11-2. The commenter recommends including language in the 1995 DEIR/EIS that describes how the Delta Wetlands Project strategies to control wildlife disease would be integrated with strategies used on the COTP site. DFG and USFWS are responsible for controlling waterfowl disease outbreaks in the Delta region and would be responsible for ensuring that Delta Wetlands' disease control program is consistent with their regional control programs. Because Mitigation Measure H-3 requires Delta Wetlands to develop and implement a disease control program in consultation with DFG and USFWS and the COTP mitigation plan was adopted by DFG and USFWS, the programs should be consistent. Any specific concerns about the consistency of Delta Wetlands' disease control program with nearby programs should be addressed to DFG and USFWS.

E11-3. The commenter is concerned about the impact of the Delta Wetlands Project on poaching and trespassing in the project area. Table 19 in Appendix G3, "Habitat Management Plan for the Delta Wetlands Habitat Islands", describes restrictions and enforcement actions for regulating the behavior and movement of hunters on the Delta Wetlands Project islands under Alternatives 1 and 2. Refer to pages 11–13 under the section "HMP Implementation Responsibilities and Authorities" for detailed descriptions of the responsibilities of agencies and Delta Wetlands in ensuring compliance with the requirements established by the HMP. Delta Wetlands personnel and local law enforcement officials would have year-round access to all Delta Wetlands Project island areas to control trespassing onsite

and to enforce laws protecting wildlife and fish and other applicable laws (see page 15 of the HMP, "Control of Trespassing and Poaching").

Chapter 3E, "Utilities and Highways", addresses law enforcement issues on the Delta Wetlands Project islands. The 1995 DEIR/EIS identified the increased need for police services as a result of the increased number of people visiting the Delta Wetlands Project islands. Impact E-8, "Increase in Demand for Police Services on the Delta Wetlands Project Islands" (see page 3E-11 of FEIS Volume 1), is considered significant; mitigation measures intended to deter criminal activity and reduce this impact to a less-than-significant level include providing adequate lighting in the vicinity of the recreation facilities, walkways, parking areas, and boat berths and 24-hour onsite private security for the recreation facilities and boat docks on the Delta Wetlands Project islands.

The manager of a DFG wildlife area in the Delta region was contacted for information about DFG's experience with trespassing and illegal hunting and its applicability to the Delta Wetlands Project. DFG operates a hunting program at the Grizzly Island Wildlife Area located on the western edge of the Delta in Solano County. Hunters who check in at Grizzly Island to hunt have never been known to leave the designated DFG hunting areas to hunt illegally in adjacent areas or in the wildlife sanctuaries at Grizzly Island. Hunting programs, such as the one proposed at the Delta Wetlands Project islands, tend to be self-policing. Trespassers occasionally enter the Grizzly Island Wildlife Area by boat from adjacent sloughs to hunt. The problem of trespassing at Grizzly Island is handled by a DFG game warden if one is available; otherwise, the county sheriff's department is called. The DFG offices in Suisun City generally respond to outside complaints by providing the telephone number of the county sheriff's dispatcher's office; the local sheriff's department dispatch is equipped to handle complaints more quickly than DFG if a game warden is not nearby. The DFG offices in Suisun City receive several complaints each year about trespassing from property owners near Grizzly Island. Occasional trespass complaints are received from nearby duck clubs. However, the DFG manager has found no evidence that connects the amount of trespassing on adjacent lands to the hunting program at the Grizzly Island Wildlife Area; trespassing in these areas and at the wildlife area is an existing problem. (Becker pers. comm.)

E11-4. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents an analysis of the potential seepage impacts of Delta Wetlands reservoir operations and evaluates the stability of the Delta Wetlands reservoir island levees. The 2000 REIR/EIS impact analysis includes the recommendations presented in Appendix H for modifying Delta Wetlands' proposed seepage monitoring program and seepage performance standards as a mitigation measure for potential project impacts. Because seepage would be controlled using interceptor wells on the reservoir islands, the project would not increase water pumping costs on neighboring islands.

THE DUTRA GROUP

December 19, 1995

Mr. Jim Sutton
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

Dear Mr. Sutton:

We are pleased to comment on the *Draft Environmental Impact Report for the Delta Wetlands Project*. Our comments are limited to the flood control aspects of the project and how the enhanced flood protection effects the entire Delta.

As we understand it, a part of the implementation of the Delta Wetlands Project is to bring the levees surrounding all four project islands to Department of Water Resources Bulletin 192-82 Standards. By strengthening these four islands, the entire Delta will be made more secure because of the strategic location of the project islands.

By riprapping the interior surface of the levees on the reservoir islands and installing an interceptor well system along the perimeter of the reservoir islands, seepage transmission from the reservoir islands appears to be adequately addressed. We believe these design elements represent sound engineering and will function effectively. E12-1

Arresting or eliminating continued subsidence on the project islands represents a significant benefit of the project. Levee maintenance will be reduced and the future security of the project islands will be enhanced.

We are encouraged to see this pro-active concept for preservation of the integrity of these important Delta Islands and look forward to timely implementation.

Thank you for the opportunity to submit these comments.

Sincerely,
THE DUTRA GROUP

R.D. Johnston

Robert D. Johnston
President

RDJ/lgd

G:\BJ\DELTAWET.LTR

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The Dutra Group

E12-1. The lead agencies acknowledge this comment supporting the project. Because this letter does not specifically comment on the environmental analysis in the 1995 DEIR/EIS, no response is required.

Dec 21,1995

Dear Sir,

I, would as a citizen, who has lived in the Delta since 1927 like to make some comments on the Delta Wetlands Project.

First and most important of all the factors of the Delta, is land subsidence and oxidation. If this is not addressed, the inevitable failure of the Delta levees from this physical fact will certainly be a continuing concern of the Delta Wetlands Project.

This environmental report mentions the fact of the Islands which take in water from the outside rivers are also sinking at a relatively controlled rate,(and this report does not emphasize the cause of this) between flooding's and that this will be a factor in allowing the Island to acquire a greater volume of depth for storage. I would like to bring up the point that it has been my observation that flood water has quite a bit of sediment in it and that this would decrease the volume of space for water storage. E13-1

As to the winter migration of birds into the Delta, they come to feed on the residue of the harvested crops and if no crops are planted or supplemental feed encouraged on the Habitant Islands of this project they will have that much less to winter from. E13-2

County General plans state that certain acreage zoning is there policy for agriculture in the Delta and that brings up the question of land use in the Delta.

If a higher use of the Delta land is to be promoted, is agriculture tax base to be a continuing policy of the County's responsibility in the Delta? If the Delta Wetlands Project can open the door for a higher use for the Delta,with also,the factor of the State acquiring Delta Lands for Mitigation and Water Transference responsibility, where does all this new direction of economic trend leave the present residents of the Delta who up to this time have been taxed to help support the Delta Levees,under the County General Plan.? E13-3

The two Political collages ,the Delta Protection Commission out of Stockton and the Cal-Fed from the Governors office have conflicting philosophies and nether one addresses the Deltas real

needs.

I am a constant promoter of the value of the Delta and have long felt that these appointed officials who have no lasting ties or responsibility in the Delta,have been a mistake.

Our population in the Delta is very small in relation to the responsibility of the Delta to the rest of the State.

One real solution would be a Resource Conservation District,which are a responsible enity with local civilian directors ,operated from State law and staffed with Federal employees.

The needs of the Delta have to be addressed and so far these have not been.

Anyway I wish the Delta Wetlands well with its progressive ideas and I hope that this non-agricultural approach will open new door for all of us in the Delta.

Thank you,

Wm Shelton
P O Box 144
Walnut Grove Calif. 95690
Phone 916-776-1890

Wm Shelton

William Shelton

E13-1. The Delta Wetlands Project islands are currently subsiding as peat soils convert into gas (i.e., oxidize), a process that is accelerated by agricultural practices (see Chapter 3D, page 3D-4 in FEIS Volume 1). In general, flooding the Delta Wetlands Project islands would slow the rate of soil oxidation and land subsidence by eliminating agricultural practices on the reservoir islands. Subsidence would still occur, but at a much slower rate. As described on page 3C-6 of the 1995 DEIR/EIS (page 3C-Z of FEIS Volume 1), the Delta Wetlands reservoir islands are expected to act as settling basins for sediments, which could decrease the volume for storage over time. However, sedimentation on the Delta Wetlands Project islands was predicted to be less than 0.02 inch of deposition per year. Therefore, the amount of subsidence predicted to occur on the islands (approximately 0.5 inch per year) would more than offset the increases in sediment on the reservoir islands.

E13-2. Wintering waterfowl foraging habitats will be developed and managed on the habitat islands as described on page 3H-22 of the 1995 DEIR/EIS (page 3H-24 of FEIS Volume 1) and in Table 2 of the HMP (Appendix G3). The HMP design for waterfowl habitats would provide more pounds per acre of natural and agricultural crop seed than typically would be available as harvest residue. Therefore, the Delta Wetlands Project would increase waterfowl forage on the habitat islands over existing conditions.

E13-3. Approval of the Delta Wetlands Project would not have a direct effect on county policies concerning agricultural zoning in the Delta, nor would project approval affect the amount of remaining land zoned for agricultural land use in the Delta. As discussed in Chapter 3I, "Land Use and Agriculture", in the cumulative impacts section (pages 3I-21 through 3I-23 of the 1995 DEIR/EIS [pages 3I-24 through 3I-26 of FEIS Volume 1]), the Delta Wetlands Project, together with other known and anticipated projects, would result in the cumulative loss of a substantial amount of farmland in the Delta.

A description of existing fiscal conditions, including property and sales tax revenue, on the Delta Wetlands islands is provided in Chapter 3K, "Economic Conditions and Effects". Under the proposed project, property tax revenues generated by the four islands would increase; in addition, sales tax revenue generated by use of the islands would likely increase because of the increase in regional income associated with project-related employment and expenditures. See Chapter 3K for more information.

Delta Wetlands is planning to improve existing levees on all four project islands (see Chapter 3D, "Flood Control"). As a local landowner, Delta Wetlands would continue to contribute to the maintenance of project island levees through the reclamation districts that serve the project islands. Farmers and landowners in the Delta who are currently being assessed by reclamation districts for levee maintenance activities would presumably continue to pay these assessments. The Delta Wetlands Project is not anticipated to result in increased assessments for levee maintenance in the Delta.

Letter E14

ELLISON & SCHNEIDER

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December 20, 1995

VIA HAND DELIVERY

Jim Sutton
State Water Resources Control Board
901 P Street, Third Floor
P.O. Box 2000
Sacramento, California 95812-2000

Jim Monroe
U.S. Army Corps of Engineers
Regulatory Section
1325 "J" Street, 14th Floor
Sacramento, California 95814-2922

Re: Delta Wetlands Project -- Comments Draft EIR/S

Dear Jim and Jim:

Enclosed are the minor comments of Delta Wetlands on the Draft Environmental Impact Report/Environmental Impact Statement ("DEIR/S") for the Delta Wetlands project. Delta Wetlands believes that the DEIR/S fully and completely examines the impacts of the project on the environment and is an exemplary effort by Jones and Stokes Associates under the direction of the Lead Agencies.

If you have any questions, please feel free to call me, John Winther and/or David Forkel.

Sincerely,

Mary J. Novak

Mary J. Novak

Enclosure
cc: Jim Canaday
David Cornelius
David Forkel
Jim Easton

DELTA WETLANDS COMMENTS
(December 20, 1995)

Summary

Page S-6, fourth full paragraph. This paragraph states that water transfers and water banking on DW islands would require further environmental analysis beyond that provided for the DW project. The impacts associated with vegetation, wetlands and wildlife on the reservoir islands would not require further environmental review; the values for those resources on the reservoir islands are fully compensated by the HMP. However, fisheries and hydrodynamics would have to be transfer specific. E14-1

Chapter 2. Project Alternatives

Page 2-3, bottom of page through page 2-4, top of page. This paragraph states that water transfers and water banking on DW islands "would require separate authorization and may require further environmental documentation beyond that provided for the DW project." The impacts associated with vegetation, wetlands and wildlife on the reservoir islands would not require further environmental review; the values for those resources on the reservoir islands are fully compensated by the HMP. E14-2

Page 2-9, sixth full paragraph. The habitat islands compensate for the impacts of project facility construction and water storage operations on the reservoir islands. In addition, the vegetation, wetlands and wildlife values provided by the habitat islands compensate for all uses of the reservoir islands, including the use of the reservoir islands for water transfers and banking. E14-3

Page 2-16, third and fourth full paragraphs. These paragraphs describe a process that has not yet been determined. In the final EIR/S these paragraphs should be struck and the following paragraph inserted:

> The DW project permits would contain terms and conditions that specify the allowable project operations under which the DW project will be able to divert water to storage. SWRCB terms and conditions for the requested DW water rights would specify DW project operational rules and guidelines related to meeting applicable Delta objectives, not interfering with prior water rights and for taking only surplus water. E14-4

This comment also applies to Appendix A4, Page A4-3, second through fourth paragraphs and Chapter 3A, Page 3A-11, first and second paragraphs.

Chapter 3B. Hydrodynamics

Page 3B-22 bottom of page. The unacceptable hydrodynamic conditions in Old and Middle River are limited by maximum SWP pumping exports, not by DW operations. E14-5

Chapter 3C. Water Quality

General Comment. DW endorses the qualitative approach to changes in DOC sources set forth in Table 3C-2, item #4 as it is straightforward and therefore, should be described in more detail in the text of the chapter. Through this approach, it should be concluded that the DW Project impacts described in this chapter are insignificant and when taken as a whole, result in a slight benefit. This is further supported by the analysis set forth by Gilbert, et al. in the attached Memo to A. Schneider. E14-6

Chapter 3D. Flood Control

Page 3D-3, fourth paragraph. HLA is no longer collecting the data referenced in this paragraph; that task is now being done exclusively by Hultgren Geotechnical Engineers. E14-7

Page 3D-9, seventh full paragraph. This paragraph makes an unstated assumption that probably should be included, which is that the measured head increase in a well or wells must correlate with filling of the reservoir to be considered an indication of being caused by DW. E14-8

Page 3D-10, first full paragraph. The bi-weekly reports called for during initial diversions are appropriate for the first year of diversion and as diversions reach new stages thereafter. Monthly reports should be adequate for years two and three, and quarterly reports for the following years. E14-9

Page 3D-10, second full paragraph. Prior to installing additional interceptor wells, the pumping rates of the existing interceptor wells should be adjusted. E14-10

Page 3D-11, seventh paragraph. This paragraph provides a level of detail to the program that is preliminary and subject to change with final design. E14-11

Page 3D-16, eighth paragraph. Activity for final design of the dam on the south side of SR12 has been suspended since Alternative 3 is no longer the preferred alternative. E14-12

Chapter 3F: Fishery Resources

Page 3F-9, third full paragraph. The water residence time on both reservoir and habitat islands will be such that an invertebrate population will be developed and supported by whatever DOC levels there may be in the water. The phyto- and zooplankton will in part evolve into higher forms of particulate organic carbon (POC), which would be an addition to the food chain and which would be excluded from the DOC component that threatens water quality. These organics will have positive benefits for fish as explained in the attached analysis by Natural Resource Consulting Scientists, Inc., dated December 4, 1995. E14-13

Page 3F-11, sixth paragraph. As described in the Biological Assessment for the DW project, the USFWS mortality model was based on empirical data using many pre-smolts in the agency's experiments. Therefore, the recent "Delta-rearing mortality" assumed by NMFS is already inherently incorporated into the USFWS salmon model and the applicability of the model to winter-run mortality has validity. E14-14

Page 3F-11, eighth paragraph. Because young chinook salmon do not behave as a "particle of water", the CDFP would likely significantly overstate salmon mortality, or at least indicate a worst-case impact. Any young salmon in the Delta would not passively follow the flow. It is more probable that most fish would take up short-term residency in the Delta and rear (pre-smolts) or actively migrate to salt water following tidal-induced behavioral cues (smolts). E14-15

Page 3F-16, ninth full paragraph. The Kjelson et al. (1989b) reference in this paragraph used the 60°F value for conditions throughout the interior Delta, not localized Delta channel water temperatures as implied here. The affects of DW project discharges on water temperature will only be localized. E14-16

Page 3F-17, final paragraph. This paragraph cites Table 3F-1 for the proposition that DW diversions were simulated to reduce average monthly outflow "by more than 25% during September-January of some years." This statement grossly overstates the impacts associated with DW operations. The average is 2.88-5.85% and the 18 out of 70 years is more accurately 18 times in 350 months (70 years x 5 months) or 5.14% of the time. E14-17

Page 3F-19, first paragraph. When DW is not diverting to storage under Alternatives 1-3, there would be a beneficial affect to QWEST due to the decrease in "actual" in-Delta consumptive use that is not currently addressed in the QWEST calculation. E14-18

Page 3F-22, seventh paragraph. Although little is currently understood about factors affecting annual variability in distributions and timing of delta smelt spawning, the geographic spawning distribution of delta smelt is recognized to vary from year to year. Some spawning is also suspected to occur in sloughs tributary to Suisun Bay and Montezuma Slough in some years. There is some recent evidence suggested by U.C. Davis investigators and DFG monitoring (Dale Sweetnam, personal communication) that in some years a higher proportion of delta smelt spawn on the Sacramento River side of the Delta and thus, impacts of DW operations in those years E14-19

would be less than assessed with the assumed uniform spawning distribution. The response of delta smelt spawning migration timing differs depending on water year hydrologic conditions. The reproductive cycles and onset of various reproductive events for many species of estuarine and riverine fishes is affected by such environmental factors. **E14-19 cont'd**

Page 3F-22, first paragraph. DW impacts on striped bass are considered significant because of the indirect effects associated with DW operations. However, the analysis in this chapter fails to account for the benefits of forgone agricultural diversions or the screening of screenable fish due to implementation of the DW project. **E14-20**

Page 3F-23, second paragraph. The DW project's use of fish screens will reduce affects of diversions on adults and larger juvenile Delta smelt. Additionally, information is being developed to facilitate better understanding of diversion-related mortality of smelt (e.g. entrainment, impingement, abrasion and predation). **E14-21**

Page 3F-24, fourth full paragraph. As with delta smelt, the DW project's use of fish screens would reduce effects of diversions on longfin smelt adults and larger juveniles. **E14-22**

Page 3F-35, first full paragraph. The likelihood of levee failure is greater under the No-Project alternative than under the other Alternatives analyzed in this DEIR/S. Levee failure would have serious consequences for Delta fisheries. The benefits of increased levee stability need to be recognized. **E14-23**

APPENDIX G3 - HABITAT MANAGEMENT PLAN FOR THE DELTA WETLANDS HABITAT ISLANDS

Page G3-6, final paragraph. The closed zones referenced here were designed to ensure that compensation objectives are met for greater sandhill cranes only. The closed zones may be a benefit to waterfowl, but they were not required to meet compensation objectives for waterfowl. **E14-24**

Table G3-19, page 4. The agreements made at the HMP meetings were that the mourning dove hunting restrictions identified in the "Free-Roam Hunting Zone" column apply only during waterfowl hunting season. Mourning dove hunting should not be restricted prior to waterfowl season. **E14-25**

APPENDIX G5 - SUMMARY OF JURISDICTIONAL WETLAND IMPACTS AND MITIGATION

Page G5-10, fourth paragraph. DW has not agreed to plant tule and cattail plugs on the habitat islands. DW is required to meet the performance criteria set forth in the HMP. Plugs or seeds therefore may be planted to establish these habitat types, but only if necessary in the event of a failure of the habitat to occur naturally. E14-26

Page G5-11, top of page. This paragraph unnecessarily limits wetlands management to disking. To maintain productivity of wetland plants, portions of each cell may be disked or otherwise managed. E14-27

CHAPTER 3H: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES - WILDLIFE

Page 3H-19, fifth full paragraph. The fifth and sixth bullets on this page, as well as other statements in this chapter, state that the purpose behind requiring closed zones on the habitat islands was to provide benefits to waterfowl as well as greater sandhill cranes. However, the closed zones were required to compensate for greater sandhill crane impacts only. The closed zones may be a benefit to waterfowl, but they were not required to meet compensation objectives for waterfowl. E14-28

Chapter I. Land Use and Agriculture

Chapter 3I-14, fifth full paragraph. The document states that no mitigation is available for Impact I-3; however, reduction of agricultural production on Holland and Webb Tracts (and other west Delta islands) has been identified by the state (DWR 1988) as critical for Delta water quality protection (see page 3I-15, third paragraph). Discussions that DW has had with Contra Costa County indicate that the county does not agree with the "prime" agricultural land classification. E14-29

Chapter 3J. Recreation and Visual Resources

General Comment. DW believes the boat usage assumptions developed for this chapter are too high and therefore, the impacts to other resource areas (e.g. traffic and air quality) are overstated. E14-30

Chapter 3L. Traffic

Page 3L-5, fourth full paragraph. The vehicle travel between the recreation facilities and the airstrip will be di minimus. E14-31

Chapter 3M. Cultural Resources

Page 3M-1, fourth paragraph. This paragraph references intact burials present on Holland Tract under Alternatives 1 and 2. This is incorrect. The area with the intact burials on Holland Tract was excluded from the project area for Alternatives 1 and 2. The intact burials would only be impacted under Alternative 3. See page 3M-11, fourth full paragraph. E14-32

Memo to: Anne Schneider (copy to J. Winther)

From: J. Gilbert
B.J. Miller
T. Mongan

Re: Comments on Delta Wetlands Project Draft EIR/EIS prepared in response to your request:

Water Quality Impacts and Mitigation Measures Section (Chapter 3C)

SUMMARY

The results of the water quality analyses conducted for the Delta Wetlands Project Draft EIR/EIS support a finding of no significant impact. The water quality analyses in the EIR/EIS clearly demonstrate that the Delta Wetlands Project will have no significant impact on Delta water quality, or the quality of drinking water taken from the Delta. Therefore, there is no need for most of the mitigation measures proposed in the EIR/EIS to mitigate "significant impacts" on water quality. Monitoring water releases from Delta Wetlands islands for compliance with discharge standards will suffice to insure that project impacts on Delta water quality are not significant.

DISCUSSION

This discussion of the impact analyses in the Delta Wetlands Project Draft EIR/EIS focuses on Delta Wetlands Project Alternative 1.

Analysis indicates that the Delta Wetlands Project will slightly reduce THM in drinking water taken from the Delta.

The EIR/EIS identifies significant adverse effects on disinfection byproducts created when Delta water is treated for household use. However, the supporting analysis indicates that the Delta Wetlands Project would slightly reduce harmful disinfection byproducts in drinking water. **E14-33**

Long term exposure to disinfection byproducts such as trihalomethanes (THM) is the important factor for public health. That is why THM Water Quality Objectives specify annual average values. The EIR/EIS impact analysis (Figure 3C-19, page C5-8 and Figure C5-15) indicates that long-term average THM levels in treated drinking water taken from the Delta will be 0.1% less under Alternative 1 than under the No Project Alternative. This suggests that Alternative 1 would have a small beneficial effect on public health.

There is always uncertainty inherent in any simulation modeling. More uncertainty is introduced when a series of simulation models are used in combination, as in the simulation of TIIM levels in drinking water taken from the Delta. However, the simulation modeling results are useful for indicating a trend, and they indicate that the Delta Wetlands Project will slightly reduce long-term average TIIM concentrations in drinking water taken from the Delta, and produce a small public health benefit.

The EIR/EIS data support a conclusion of insignificant impact on water quality.

It is claimed that Alternative 1 has a significant adverse impact on TIIM levels, based on simulation of monthly average TIIM levels in treated water for the years 1967 through 1991. This is because, in only three months during these 25 years (June, July and August of 1977, the worst drought year on record), monthly average simulated TIIM concentrations exceeded 90 micrograms per liter. In fact, the simulation indicates an annual average TIIM concentration for 1977 of only 74 micrograms per liter. This is well below the 100 micrograms per liter annual average Water Quality Objective and only 10% higher than the simulated annual average for the No Project Alternative. Indeed, the simulated No Project Alternative monthly average TIIM concentrations in June, July and August 1977 exceeded the EIR/EIS monthly average significance threshold of 90 micrograms per liter.

E14-33 cont'd

It seems likely that the annual average TIIM Water Quality Objective will be lowered in the future. Regardless of the anticipated change, the water quality analysis for the EIR/EIS indicates that the effects of the Delta Wetlands Project on TIIM levels in drinking water taken from the Delta will be insignificant.

Dissolved organic carbon (DOC) is important mainly because it indicates the potential for formation of disinfection byproducts such as trihalomethanes. So, it is long-term average DOC concentrations in Delta water that are of public health concern. Simulation modeling results (Figure 3C-19, Page C5-8, Figure C5-15) indicate that Alternative 1 will lower long-term average DOC concentrations in Delta waters by 1% compared to the No Project Alternative. Overlooking the uncertainty in the modeling results, this indicates that Alternative 1 would produce a small public health benefit. However, because the simulated monthly average DOC concentration for Alternative 1 exceeded the simulated DOC concentration for the No Project Alternative in one month out of the 25 year simulation (Table 3C-7 - the one month was July 1978, as shown in Table C5-3), it is claimed that Alternative 1 will have a significant impact on DOC levels in Delta water. This interpretation of the DOC analysis in the EIR/EIS effectively double counts the conclusions of the TIIM analysis.

Finally, it is claimed that Alternative 1 will have significant impacts on EC and chloride levels in the Delta, even though the simulations show that Alternative 1 will never exceed EC and chloride water quality objectives in the Delta (pages 3C-26 and 3C-27).

All these determinations of "significant impact" contradict the assumption that beneficial uses of Delta water are adequately protected if water quality parameters remain below regulatory Water Quality Objectives,.

The above conclusions are supported by material in the technical appendices to the EIR/EIS.

The technical appendices to the EIR/EIS discuss the models and data used to estimate:

- DOC contributions from Delta Wetlands Project islands;
- effects of the Delta Wetlands Project on DOC and bromine concentrations in water exported from the Delta; and
- THM concentrations in Delta water treated for municipal use.

DOC contributions from islands

The information in Appendix C3 indicates:

E14-33 cont'd

- Substantial leaching of DOC from peat soils is not likely to occur under flooded wetland conditions (pages C3-1 and C3-8).
- Only 3-4% of the organic carbon produced by decaying vegetation in ponded water remains in the water as DOC, and the rest is lost as carbon dioxide gas during aerobic decomposition (page C3-19).
- The DOC load produced by wetland vegetation is estimated at about one fourth of the DOC load produced by corn crop residues left in agricultural fields (page C3-19).
- Availability of DOC in soil water is greater in surface peat soils under agricultural conditions than in wetland soils (page C3-19).

These data indicate that Delta Wetland Project islands will contribute less DOC to Delta waters than agricultural islands. However, Appendix C4 (page C4-6) assumes DOC loading from Delta Wetland islands is roughly the same as from lowland agricultural islands.

DOC and bromine concentrations in export water

Despite the questionable assumption that DOC contributions from Delta Wetland islands are similar to the contributions from agricultural islands, model simulations indicated that

concentrations of DOC in water exported from the Delta was about 1% less with Delta Wetlands Project operations than under the No Project Alternative (page C4-9).

Table C5-3 shows that simulated bromine concentrations in water exported from the Delta are generally lower with Delta Wetlands Project operations than under the No Project Alternative. Bromine concentration is important, because it affects the production of some types of THM.

THM concentrations in treated water

E14-33 cont'd

Appendix C5 reports the results of model simulations of THM concentrations in Delta water treated for municipal use. Compared to the No Project Alternative, average THM concentrations were:

- 1% lower for Alternative 1,
- .05 % lower for Alternative 2, and
- 2% lower for Alternative 3.

DEC 1 2 1995

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TECHNICAL MEMORANDUM

To: John Winther, Delta Wetlands

From: Keith Marine, Aquatic Ecologist/Fishery Scientist

Subject: Delta Wetlands Project Benefit: Supplementing Zooplankton Availability to Delta Fishes.

Date: December 4, 1995

I have examined the potential benefit of supplementation of zooplankton production in the Delta envisioned to accompany the operation of the proposed Delta Wetlands Project in more detail than provided in the EIR/S. I have drawn on several bodies of information and knowledge which include some reports of the National Reservoir Research Program, the San Francisco Estuary Project Status and Trends Reports, discussions with Department of Water Resources biologists and technicians, and some ecological theory and working hypotheses regarding limnological processes and zooplankton population ecology. In this regard, several important ecological aspects of the proposed Delta Wetlands Project operations were found to be of interest.

The Proposed Potential Benefit

One of the potential environmental benefits envisioned to accrue from operation of the currently proposed Delta Wetlands Project is the contribution of considerable amounts of zooplankton in the discharges from project islands to the Delta channels. The main benefit of this augmentation of zooplankton to those produced in the waters of the Delta channels would be to supplement the existing food base for many important Delta fishes including:

- all life stages of delta smelt
- larval and juvenile striped bass
- larval and juvenile longfin smelt
- larval and juvenile splittail
- juvenile chinook salmon
- juvenile steelhead

E14-34

Many other species of resident and anadromous fishes and other planktivorous vertebrates (e.g., many species of waterfowl) would similarly benefit from zooplankton produced on the Delta Wetlands reservoir and habitat islands and subsequently discharged into the Delta channels.

The Operational and Ecological Context of the Proposed Potential Benefit
Conceptually, some aspects of proposed operation of the Delta Wetlands Project conform to ecosystem-level management concepts of managing for maintenance of ecological functions and dynamics. The historic winter-time flooding of Delta islands and marshlands and the subsequent primary- and secondary-level trophic production (i.e., photosynthetic carbon-fixing and micro- and macroplankton production) are considered to have been important to the historic biological productivity of the Delta (Herbold *et al.* 1992). Both Herbold *et al.* (1992) and Obrebski *et al.* (1992) in reviewing the status and trends of biotic resources of the San Francisco Bay-Delta Estuary emphasized the importance of shoal habitats (shallow water areas) for fresh and brackish water productivity. In general, proposed operations of the Delta Wetlands Project would follow the historic Delta island flooding pattern by diverting water to storage on the islands mostly during high fall and wintertime river flows. This water spread out over the reservoir islands, and distributed to managed wetland areas on the habitat islands, would have an increased biologically productive photic zone per unit volume of water compared to the same volume of water remaining in the Delta channels. Similarly, an increase in surface area of substrate for benthic production per unit of water volume compared to the same volume of water remaining in the Delta channels could also be expected. During discharge operations, planktonic and some benthic production would become available to Delta fishes. Similarly, benthic production would become accessible to waterfowl and shore birds with shallowing and exposure of the bottom substrate during reservoir island drawdowns.

E14-34 cont'd

Reduced Predation Pressure on Zooplankton Production
One operational condition that would contribute to the production of zooplankton is the use of effective fish screens on diversion intakes. By minimizing the entrainment of fishes in the diversions, the water stored on the reservoir islands and circulated on the habitat islands would be relatively fish free. The effects of fish predation on zooplankton composition, production, and population dynamics has been fairly well established in the scientific literature (Brooks and Dodson 1965, Downing 1984, Galbraith 1967, Hutchinson 1971, Lindeman 1942, Martin *et al.* 1981). In the absence of established planktivorous fish populations on the Delta Wetlands islands, zooplankton production would not be constrained through predation pressures; thus, enhancing the biomass available to Delta fishes upon discharge from the islands.

Reservoir Tailwater Enhancement
A considerable body of research has demonstrated the contribution and correlation of lacustrine zooplankton and benthos production dynamics to biotic and fishery production in tailwaters of many impoundments (Martin and Novotny 1977, Morris *et al.* 1968, Walburg *et al.* 1971). These studies have demonstrated that fishes inhabiting the tailwaters exploit the zooplankton and benthos in reservoir discharges as a principal food source. Several species of fishes inhabiting tailraces downstream from the impoundments were found to exhibit superior growth rates and condition compared to the same species inhabiting the reservoirs. While these mainstem reservoir examples do not serve as directly analogous models for the Delta Wetlands Project, nor are they without ecological impacts, they do illustrate that lacustrine zooplankton production can contribute to food resources for fishes downstream from reservoirs.

A more relevant model for the Delta Wetlands Project would be the operation of the Thermolito Afterbay on the Feather River downstream from Oroville Dam. The Thermolito Afterbay is more

similar to the Delta Wetlands reservoir islands than would be a mainstem river reservoir such as discussed in the previous paragraph. An inquiry and discussions with several DWR biologists and water quality technicians revealed that zooplankton have not been sampled as part of regular water quality monitoring programs. However, some records of primary productivity, measured as chlorophyll *a* biomass, do exist[1]. Direct measurements and comparisons of Thermolito Afterbay discharge with the receiving water of the Feather River are not available at this time but field observations of the technicians indicate that the Thermolito discharge is slightly more turbid than the Feather River which is likely indicative of an increased planktonic production in the afterbay.

Zooplankton Composition

The species composition of zooplankton that would develop in the Delta Wetlands Project reservoir islands and habitat islands wetlands is not specifically known. However, it is likely that zooplankton composition would be similar to that inhabiting Delta sloughs and backwaters areas. A brief zooplankton survey conducted in 1988 at the Bedford Demonstration Pond on Holland Tract indicated that daphnid and bosminid cladocerans and cyclopoid and diaptomid copepods dominated the zooplankton fauna during the March to July season (Ecological Research Associates, 1988 unpublished data provided to JSA). Zooplankton species in these crustacean families are known to be important prey for most larval and juvenile fishes inhabiting the Delta, including delta smelt, striped bass, American shad, and outmigrating juvenile salmonids. While no estimates of secondary productivity of the Bedford Demonstration Pond were provided, anecdotal comments indicate that samples contained tremendously abundant zooplankters. **E14-34 cont'd**

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Galbraith, Jr., M.G. 1967. Size-selective predation on *Daphnia* by rainbow trout and yellow perch. Transaction of the American Fisheries Society 96: 1-10.

Herbold, B., A.D. Jassby, and P.B. Moyle. 1992. San Francisco Estuary Project Status and Trends Report on Aquatic Resources in the San Francisco Estuary. U.S. Environmental Protection Agency. March 1992. 257p. and two appendices.

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[1]A time series data set for several years has been requested from the DWR Oroville Field Office but was not received at the time of this compilation.

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Walburg, C.H., G..L. Kaiser, and P.L. Hudson. 1971. Lewis and Clark Lake tailwater biota and some relations of the tailwater reservoir fish populations. Pages 449-467 in Reservoir Fisheries and Limnology. Special Publication No. 8. American Fisheries Society.

Delta Wetlands Properties (Ellison & Schneider)

E14-1. The NEPA and CEQA analysis states that use of the Delta Wetlands reservoir islands for water transfers and water banking would require separate authorization from the SWRCB and may require further environmental documentation. As stated repeatedly in the 1995 DEIR/EIS, Delta Wetlands would not be required to create wetland habitat on the reservoir islands to compensate for impacts on wildlife or wetland resources resulting from water storage operations. All impacts on wetlands and wildlife habitat on the Delta Wetlands reservoir islands resulting from the construction of facilities, upgrading of levees, and inundation of the islands would be offset by the creation and maintenance of compensation habitat on the habitat islands under the HMP (see Chapters 3G and 3H).

Water transfers and water banking may change the frequency and/or magnitude of water storage on the Delta Wetlands Project islands; however, these uses would not result in a need for additional facilities or storage capacity in excess of that established under terms and conditions of the Delta Wetlands water right permits. Therefore, no additional mitigation for vegetation and wildlife impacts should be needed. However, this determination must made during subsequent authorization of water transfers and banking activity.

E14-2. See response to Comment E14-1.

E14-3. See response to Comment E14-1.

E14-4. This is not a comment on the environmental effects of the project; no response is required.

E14-5. This comment refers to Impact B-9, "Cumulative Hydrodynamic Effects on Net Channel Flows", and Mitigation Measure B-1, "Operate the Delta Wetlands Project to Prevent Unacceptable Hydrodynamic Effects in the Middle River and Old River Channels during Flows That Are Higher Than Historical Flows" (see FEIS Volume 1, page 3B-24). The flow and velocity in Old and Middle Rivers are governed by the maximum allowable SWP and CVP export capacities regardless of the source of exported water. Delta Wetlands Project operations therefore cannot change the maximum flows and velocities in these channels, although they would increase the frequency of maximum channel flows and velocities.

E14-6. Project effects on DOC concentrations in Delta exports are a function of:

- the DOC concentrations in water diverted onto the Delta Wetlands islands;
- evaporative losses;
- DOC loading from peat soils and plant growth;
- residence time (i.e., the length of time that water is stored on the islands before it is discharged);
- DOC concentrations in Delta receiving waters at the time of Delta Wetlands discharges; and

the relative amount of Delta Wetlands water in exports.

As shown in the evaluations of Delta Wetlands Project impacts on DOC presented in Chapter 3C of the 1995 DEIR/EIS and Chapter 4 of the 2000 REIR/EIS (see FEIS Volume 1, Chapter 3C), DOC concentrations at the export locations under project operations may be higher or lower in any given month than concentrations under no-project conditions. Because the increases sometimes exceed the monthly significance threshold, project effects on DOC concentrations are considered a significant impact. See also response to E14-33 below.

E14-7. The third sentence of the fourth paragraph in page 3D-3 of the 1995 DEIR/EIS (page 3D-3 of FEIS Volume 1) has been revised as follows, in response to this comment and comments on the 2000 REIR/EIS (see Comment R10-26):

> Site-specific information on groundwater conditions on the Delta Wetlands islands and neighboring islands ~~is now being~~ was collected by ~~HLA and~~ Hultgren Geotechnical Engineers under contract to Delta Wetlands between 1989 and 1997 to give an indication of existing seepage through the aquifer.

E14-8. Changes in the water table on adjacent islands attributable to the Delta Wetlands Project would coincide with reservoir filling and drawdown periods. Therefore, seepage performance standards would apply during reservoir fillings.

E14-9. The commenter is correct in stating that the biweekly reporting described in the 1995 DEIR/EIS would apply during the first year of diversion and as diversions reach new stages thereafter. The technical review committee formed to review groundwater monitoring data collected during the operation of the project would be responsible for determining the appropriate reporting frequency after the first year of filling.

The protest dismissal agreement submitted by Delta Wetlands and EBMUD during the water right hearing proposes more details regarding the structure and duties of the technical review committee, identified in the agreement as the "Reservoir Island Monitoring and Action Board (MAB)". Under the proposed agreement, Delta Wetlands would summit monitoring and seepage data to the MAB at each stage of initial reservoir filling. After that initial filling, the MAB would review monitoring and seepage data at least once every 3 months during the remainder of the first year of project reservoir island operation. Additionally, Delta Wetlands would make groundwater and surface water data (e.g., daily mean groundwater levels from seepage monitoring and background wells, daily pool elevations in the reservoirs, daily mean of water level in channels) available publicly via the Internet or similarly accessible means as soon as readily available. The SWRCB included some of the terms of the protest dismissal agreement in the terms and conditions of the Delta Wetlands water right permit.

E14-10. The commenter is correct in stating that before additional interceptor wells are installed, pumping rates of existing wells would be adjusted to draw down surrounding groundwater

levels to the extent feasible with the existing system. Appendix H of the 2000 REIR/EIS describes Delta Wetlands' proposed remedial measures to control seepage in more detail and recommends measures to improve the long-term success of the interceptor well system. The 2000 REIR/EIS impact analysis includes the recommendations presented in Appendix H for modifying Delta Wetlands' proposed seepage monitoring program and seepage performance standards as a mitigation measure for potential project impacts.

The protest dismissal agreement submitted by Delta Wetlands and EBMUD during the water right hearing states that Delta Wetlands would take the following actions to control seepage before seepage reaches the diversion suspension limits:

1. Increase pumping rates in interceptor wells.

2. Lower outfall head at relief wells.

3. Redevelop interceptor wells to improve specific capacity of the wells.

4. Redevelop relief wells to improve specific capacity.

5. Install additional interceptor wells.

6. Install additional relief wells.

7. Implement other mitigation that may be mutually agreeable between Delta Wetlands, the affected adjacent landowners, and the neighboring island reclamation district.

8. Stop diversion.

As described above, the SWRCB included some of the terms of the protest dismissal agreement in the terms and conditions of the Delta Wetlands water right permit.

E14-11. The construction techniques described on page 3D-11 of the 1995 DEIR/EIS (page 3D-12 of FEIS Volume 1) are preliminary and are used for analysis of the environmental effects of the Delta Wetlands Project in the 1995 DEIR/EIS. Actual construction techniques would not result in impacts that exceed those based on the assumptions in the NEPA and CEQA analysis. See also Appendix H of the 2000 REIR/EIS.

E14-12. Although design activity for the Wilkerson dam is not ongoing, the 1995 DEIR/EIS used the most recent design information for purposes of evaluating the environmental impacts of the four-island alternative.

E14-13. The potential benefit of the Delta Wetlands Project described in the comment was identified on page 5-17 of Appendix F2 of the 1995 DEIR/EIS. Levels of productivity and potential benefits to Delta species during discharge cannot be determined from available information.

E14-14. The best available information was used in the evaluation of Delta Wetlands Project impacts on chinook salmon. As discussed on page 3F-11 of the 1995 DEIR/EIS (pages 3F-12 and 3F-13 of FEIS Volume 1), the methods provide an index of potential project effects that can be used to compare alternative Delta Wetlands operations. The indices should not be construed as actual levels of mortality. Simulated monthly conditions cannot accurately characterize the complex conditions and variable time periods that affect survival during migration of salmon through the Delta. See also responses to Comments A2-4 and A2-5 from NMFS and C14-32 from MWD regarding the mortality index used in the fisheries impact assessment in the 1995 DEIR/EIS.

E14-15. The impact assessment approach was designed to be conservative (i.e., assess maximum possible impacts on fish). Many factors that affect the survival of chinook salmon in the Delta are poorly understood; therefore, statements about relationships between actual mortality and indices of mortality must identify the uncertainty of available information. See also response to Comment C14-32.

E14-16. Local impacts were implied by the last statement in the last paragraph under "Water Temperature" on page 3F-16 of the 1995 DEIR/EIS (page 3F-18 of FEIS Volume 1): "The proportion of the juvenile chinook salmon population exposed to Delta Wetlands discharge would likely be much less because most juvenile chinook salmon do not migrate along the Old and Middle River pathway (U.S. Fish and Wildlife Service 1987)". Water temperature impacts would be restricted to the channels receiving Delta Wetlands discharge and would decline with distance from the discharge point.

E14-17. The statement referenced in this comment identifies the potential annual frequency of reductions in outflow that would exceed 25%, as evaluated in the 1995 DEIR/EIS. The project as evaluated would be unlikely to cause reductions in outflow of 25% or more in more than 1 month each year. Presentation of the frequency on a monthly basis, as suggested in the comment, would not provide information on the frequency of annual occurrence. With incorporation of the FOC and biological opinion RPMs into the proposed project, the potential effects of the project on outflow are substantially reduced from the results presented in the 1995 DEIR/EIS analysis.

E14-18. The increase in QWEST and a concurrent increase in Delta outflow is attributable to discontinuation of Delta Wetlands' agricultural diversions; this increase was not specifically discussed in the text on pages 3F-17 (Delta outflow) and 3F-19 (QWEST) in Chapter 3F of the 1995 DEIR/EIS (pages 3F-19 and 3F-20, respectively, of FEIS Volume 1). Simulated changes in QWEST are shown in Appendix F2, Table 5-6. Simulated QWEST increased during the January-through- September period for many years and increased during the March-through-September period in most years of the 70-year simulation performed for the 1995 DEIR/EIS.

E14-19. See response to Comment D13-16.

E14-20. The benefits of forgone agricultural diversions and the protection provided by fish screens are mentioned in the text to which the commenter refers. Although forgoing agricultural diversions could reduce total entrainment losses in the Delta, the population benefit could not be quantified with available information. The impact conclusion was based on the occurrence of historical entrainment from November through January and the changes in hydrologic conditions that may have contributed to entrainment. Delta Wetlands diversions to storage would not directly entrain striped bass (fish screens would prevent entrainment); however, it was concluded that diversions would contribute to conditions that historically have coincided with high entrainment at the CVP and SWP export pumps (i.e., high Delta diversion rates during the first major increase in Delta inflow). These indirect entrainment effects are addressed by incorporation of the FOC and biological opinion RPMs into the proposed project.

E14-21. Response to Comment E14-20 applies to delta smelt as well as striped bass. See also response to Comment B6-60 regarding the fish screening measures in the FOC and biological opinion RPMs, which were incorporated into the proposed project.

E14-22. Response to Comment E14-20 applies to longfin smelt as well as striped bass. See also response to Comment B6-60 regarding the fish screening measures in the FOC and biological opinion RPMs, which were incorporated into the proposed project.

E14-23. Levee failures could have substantial detrimental effects on Delta fish. The benefit to Delta fish resulting from the reduced probability of levee failure was discussed in Appendix F2 of the 1995 DEIR/EIS on pages 5-16 and 5-17. The benefit cannot be quantified with available information.

E14-24. Closed hunting zones would be established for wintering waterfowl as well as for greater sandhill cranes. As described in the HMP, the closed hunting zones would provide undisturbed foraging areas for wintering waterfowl. See page 4 of the HMP under "Foraging Habitat for Wintering Waterfowl: Compensation Provided on the Habitat Islands", and Table 16, "Waterfowl Management Strategies for the Habitat Islands", which state that lakes and a portion of suitable waterfowl foraging habitats should be closed to hunting to minimize human disturbance.

E14-25. The commenter is correct. Hunting would be permitted throughout the portion of mourning dove season that occurs before the opening of waterfowl season. Hunting restrictions described in Table 19 of the HMP apply to the waterfowl hunting season.

E14-26. See response to Comment B6-69.

E14-27. Management of mixed agriculture/seasonal wetlands on habitat islands is described on pages G5-10 and G5-11 in Appendix G5. The second paragraph describes disking as a method for maintaining habitat productivity and does not preclude implementation of other management techniques for maintaining the productivity of wetland plants.

E14-28. As described on page 3H-19 of the 1995 DEIR/EIS (page 3H-21 of FEIS Volume 1), major elements of the HMP include the establishment of three closed hunting zones: one on Bouldin Island that would provide foraging areas for greater sandhill cranes, and two additional zones (one on each habitat island) that would provide foraging and resting areas for waterfowl. The HMP (Appendix G3) describes compensation provided on the habitat islands for greater sandhill cranes and wintering waterfowl. The sixth full paragraph of page 3 states that "to reduce the impact of hunter disturbance on foraging [greater sandhill] cranes, three closed hunting zones will be established on the habitat islands", and the seventh full paragraph of page 4 states that "three closed hunting zones will be established on the habitat islands to provide undisturbed foraging habitat [for wintering waterfowl]". Therefore, both objectives for the closed hunting zones as described in the 1995 DEIR/EIS and FEIS.

E14-29. Chapter 3I, "Land Use and Agriculture" of the 1995 DEIR/EIS stated that Alternative 1 is inconsistent with the Contra Costa County General Plan Agricultural Principles (Policies 8-G and 8-H) and that no mitigation is available to reduce this impact to a less-than-significant level. Contra Costa General Plan Policy 8-G seeks "to encourage and enhance agriculture, and to maintain and promote a healthy and competitive agricultural economy" (Table 3I-7 in the 1995 DEIR/EIS and FEIS Volume 1). Alternative 1 is inconsistent with this policy because its implementation would remove agricultural land on Holland and Webb Tracts from production, effectively reducing the size of Contra Costa County's agricultural economy. Additionally, both islands have historically supported agricultural production. Reducing agricultural production on Holland and Webb Tracts and other islands may help protect or improve Delta water quality; however, removing farmland from production on Holland and Webb Tracts would not mitigate the impact associated with the inconsistency of Alternative 1 with Policy 8-G. No mitigation is available for this impact.

Contra Costa County General Plan Policy 8-H states that it is the County's goal "to preserve prime productive agricultural land outside the Urban Limit Line exclusively for agriculture" (Table 3I-7 in the 1995 DEIR/EIS and FEIS Volume 1). As discussed in Chapter 3I, the quality and long-term productivity of the soils on the Delta Wetlands islands is debatable, although the California Department of Conservation has designated portions of Holland and Webb Tracts as prime farmland based on soil surveys conducted by the Natural Resources Conservation Service. The Contra Costa County Community Development Department, however, has indicated that under its criteria for designating prime agricultural land, the department does not consider the soils on Holland and Webb Tracts to represent prime farmland (refer to Comment Letter C13). Chapter 3I has therefore been revised to reflect that the project is considered consistent with Contra Costa County General Plan Policy 8-H and that no mitigation is required (see response to Comment C13-16).

E14-30. As stated on page 3J-2 of the 1995 DEIR/EIS under "Recreation" (page 3J-2 of FEIS Volume 1) in Chapter 3J, "Recreation and Visual Resources", estimates of recreational boating associated with the Delta Wetlands Project were based on the potential use of recreation facilities at project buildout. See Master Response 5, "Mitigation of

Environmental Effects Related to Use of Recreation Facilities", and responses to Comments B5-8 and B6-58 for more information on boat use estimates.

E14-31. The traffic analysis presented in the 1995 DEIR/EIS is based on a worst-case scenario whereby all recreationists would travel to the Delta Wetlands Project islands in passenger vehicles. Additionally, vehicle travel between recreation facilities and the Bouldin Island airstrip would be negligible. Therefore, vehicle travel between recreation facilities and the Bouldin Island airstrip was not included in the sources of traffic. A description of air traffic generated under the Delta Wetlands Project is presented on page 3L-13 of the 1995 DEIR/EIS (page 3L-15 of FEIS Volume 1).

E14-32. As stated on page 3M-11 of the 1995 DEIR/EIS (page 3M-12 of FEIS Volume 1), site CA-CCo-593 is within the area of potential effects for Alternatives 1 and 2. Although no intact burials have been found at CA-CCo-593, their presence cannot be ruled out. Therefore, the text in Chapter 3M regarding the effect of Alternatives 1 and 2 on intact burials, if present, on Holland Tract is correct. The language in the summary on page 3M-1 of the 1995 DEIR/EIS (FEIS Volume 1, page 3M-1) has been revised to reflect this information more accurately.

E14-33. The commenter states that the project would have water quality benefits when evaluated as an average annual change in water quality variables. However, project effects on water quality are evaluated on a monthly basis. The impact analysis presented in the 1995 DEIR/EIS indicated that project operations under Alternatives 1 and 2 could result in increases in salinity, DOC, or THMs that sometimes exceed significance thresholds, which are applied to monthly changes, not annual averages; therefore, impacts on these variables were identified as significant. The analysis of potential impacts of the proposed project on export salinity, DOC, and THMs was updated in the 2000 REIR/EIS. As described in Chapter 4 of the 2000 REIR/EIS, the impacts of Alternatives 1 and 2 on salinity, DOC levels, and potential formation of THMs remain significant because changes attributable to project operations could exceed the significance thresholds in some months (see Chapter 3C of Volume 1 of this FEIS). The proposed mitigation, which includes monitoring and adjustment of discharge rates, would reduce impacts to a less-than-significant level. The Delta Wetlands Project WQMP negotiated by Delta Wetlands and CUWA includes requirements for monitoring, modeling, and operational controls of water quality that would provide protection of drinking water quality that is equivalent to or better than the mitigation measures in the NEPA and CEQA analysis completed for the project. See also response to Comment C9-1 and Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", regarding the protections provided by the Delta Wetlands WQMP.

E14-34. The project could supplement the existing food base available to Delta fish, but productivity of the reservoir islands and benefit to Delta fish cannot be quantified with the available information. See response to Comment E14-13.

Letter E15

Pacific Gas and Electric Company

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P.O. Box 277444
Sacramento, CA 95827

December 20, 1995

State Water Resources Control Board
Division of Water Rights
Attention: Mr. Jim Sutton
P.O. Box 2000
Sacramento, CA. 95812-2000

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Mr. Jim Monroe
1325 J Street, Room 1444
Sacramento, CA. 95814-2922

Subject: Draft Environmental Impact Report/Statement for the Delta Wetlands Project; Water Right Applications 29061, 29062, 29063, 29066, 30267, 30268, 30269, and 30270; Petitions To Change The Applications; And Application To The U.S. Army Corps Of Engineers For A Permit Pursuant To Section 404 Of The Clean Water Act and Section 10 Of The Rivers And Harbors Act In Contra Costa And San Joaquin Counties.

Dear Mr. Sutton and Mr. Monroe:

Thank you for the opportunity to comment on this Draft EIR\EIS. Please accept these comments in addition to the previous letters and personal communications PG&E has submitted, dating back to 1987, regarding this project.

PG&E owns and operates extensive electrical and natural gas facilities located within the proposed Delta Wetlands project area. To promote the safe and reliable maintenance and operation of utility facilities, the California Public Utilities Commission (CPUC) has mandated specific clearance requirements between utility facilities and surrounding objects or construction activities. To ensure compliance with these standards, project proponents should coordinate with PG&E early in the development of their project plans. Any proposed development plans should provide for unrestricted utility access and prevent easement encroachments that might impair the safe and reliable maintenance and operation of PG&E's facilities. **E15-1**

Project proponents will be responsible for the costs associated with the relocation of existing PG&E facilities to accommodate the proposed Delta Wetlands Project. Because facility relocations require long lead times and are not always feasible, project proponents are encouraged to consult with PG&E as early in their planning stages as possible.

Please be advised, Delta Wetlands has not yet established with PG&E any formalized plan, for receiving electric service at any of the proposed pumping/siphon or recreation sites, nor for any coordinated relocation of the existing electric transmission/distribution facilities within the impacted area. PG&E's provision of such new service and/or relocations (at Delta Wetland's expense) may entail the reinforcement, rearrangement, and/or new construction of electric transmission and distribution facilities, either on the four immediate islands or upon surrounding tracts. Delta Wetlands is strongly encouraged to establish (as soon as possible) with PG&E, a coordinated plan to address the relocation of existing electric facilities, and to address the impact new facilities required to provide electric service. **E15-1 cont'd**

The term "transmission" generally refers to facilities 50,000 volts (50kV) and above, while "distribution" refers to electric facilities less than 50kV. DW seems to have intermixed these terms throughout the EIR, most notably on pages 3E-9 & 3E-10. Please be aware, PG&E is presently not aware of any electric *transmission* facilities on the four immediate islands - all facilities in the immediate area are most likely, "distribution". While it is likely that any relocation work may only involve distribution facilities, please note that providing electric service to DW is likely to impact both distribution and transmission facilities in the immediate and surrounding area - including but not limited to, construction of new transmission and/or distribution lines, reconductoring and/or reinforcement of existing lines, expansion of local substations, or construction of new substations. Until a specific formalized plan of new service and relocation is identified, DW's EIR should address the potential for this additional impact. Again, Delta Wetlands is strongly encouraged to establish (as soon as possible) with PG&E, a coordinated plan to address the relocation of existing electric facilities, and to address the impact of any new facilities required to provide electric service. **E15-2**

Relocations and upgrades of PG&E's electric transmission and substation facilities (50,000 volts and above) could also require formal approval from the CPUC. If required, this approval process could take up to two years to complete. The Delta Wetlands Project is expected to require the upgrade of at least one substation. Delta Wetlands proponents, with design plans, should consult with PG&E, as soon as design plans are available, for additional information and assistance in the development of cost and schedule.

The proposed project will have a cumulative impact on PG&E's gas and electric systems and may require on-site and off-site additions and improvements to the facilities which supply these services. Because utility facilities are operated as

an integrated system, the presence of an existing gas or electric transmission or distribution facility does not necessarily mean the facility has the capacity to connect new loads.

Expansion of distribution and transmission lines and related facilities is a necessary consequence of growth and development. In addition to adding new distribution feeders, the range of electric system improvements needed to accommodate this project may include upgrading existing substation and transmission line equipment, expanding existing substations to their ultimate buildout capacity, and building new substations and interconnecting transmission lines. Comparable upgrades or additions needed to accommodate additional load on the gas system could include facilities such as regulator stations, odorizer stations, valve lots, distribution and transmission lines. E15-2 cont'd

We would like to recommend that environmental documents for proposed development projects include adequate evaluation of cumulative impacts to utility systems, the utility facilities needed to serve those developments and any potential environmental issues associated with extending utility service to the proposed project. This will assure the project's compliance with CEQA and NEPA and reduce potential delays to the project schedule.

PG&E encourages the State Water Resources Control Board, Division of Water Rights and the U.S. Army Corps of Engineers, Sacramento District to include information about the issue of electric and magnetic fields (EMF) in the Environmental Impact Report and Environmental Impact Statement.

EMFs are invisible fields of force created by electric voltage (electric fields) and by electric current (magnetic fields). Wherever there is a flow of electricity, both electric and magnetic fields are created; in appliances, homes, schools and offices, and in power lines. there is no scientific consensus on the actual health effects of EMF exposure, but it is an issue of public concern. PG&E relies on organizations and health agencies such as the California Department of Health Services, U.S. Environmental Protection Agency and the Electric Power Research Institute to review research on EMF and provide a foundation for developing policies. E15-3

Because there is concern about the possible health effects of exposure to EMF, we support and fund medical, scientific, and industry research on EMF. It is PG&E policy to consider EMF in the design, planning and construction of new and upgraded facilities.

The Project proponent is responsible to ensure that PG&E's existing rights of interest in the properties (easements, leases, permits etc.) affected by Delta Wetlands Project are not diminished. Diminishment of PG&E rights could include impairment of access, diminution of the full enjoyment of our rights (i.e. modification/expansion), or creation of site conditions that impact PG&E's ability to operate our gas and electric facilities (i.e. Habitat Conservation Plan, creation of wetlands, grading). E15-4

The expansion of existing facilities, required to serve the Delta Wetlands Project, which have been "grandfathered" under statutes or standards enforced since the construction of that facility may require updating the facility to current standards. The impact of updating these "grandfathered" facilities is added substantial costs and time delays in providing service to the proposed project. E15-5

The project proponent will be responsible for all or part of PG&E's costs associated with modifications or improvements to PG&E facilities resulting from this project.

Chapter 3E: Affected Environment and Environmental Consequences Utilities and Highways.

This chapter of the DEIR specifically addresses the impacts on Gas Facilities and Transmission Pipelines as a result of the proposed project. Although this sections' contents are an improvement over previous documentation, many of the statements which have been credited to PG&E personnel have been taken out of context and do not support the conclusions which have been drawn in the Draft EIR/EIS. Specifically the March 14, 1988 letter from Marvin Bennett and the April 26, 1991 letter from James Stoutamore which commented on the NOP and DEIR for previous versions of this project explain PG&E's use of and bring up serious concerns about the proposed flooding of Bacon Island which have still not been adequately addressed. Since that time, PG&E's knowledge and use of our two Gas Transmission Lines across Bacon Island have changed.

This response will attempt to re-emphasize those points which require additional clarification, correct those statements in the DEIR which are either no longer true or were never true and provide information on impacts not considered in previous documentation.

Affected Environment: Gas Facilities and Transmission Pipelines - Bacon Island

PG&E continues to maintain and operate the 22 inch L-57B across Bacon Island and it remains our only connection between our McDonald Island Gas Storage Field and the rest of our transmission system. This pipeline, however, is utilized during the entire year either to deliver gas for storage to our McDonald Island Facility or to withdraw gas from our McDonald Island Facility. This facility is critical to our normal year round operations and must be available at all times in order for PG&E to reliably meet our customers gas load. The portion of L-57A across Bacon Island is presently not in operation, however it is still being maintained by PG&E for future use.

Although both facilities are adequately weighted for "temporary" flooded conditions, neither facility was designed to operate in a continuously submerged environment. Many necessary maintenance practices presently occur on an ongoing basis for both facilities across Bacon Island and would be impeded by flooding. E15-6

Impacts and Mitigation Measure of Alternative 1:
Gas Facilities and Transmission Pipelines - Bacon Island

PG&E asserts that the Alternative 1 proposal will definitely result in the need for new facilities and an increase and substantial alteration of maintenance on the existing pipelines on Bacon Island. Additionally, the flooding of Bacon Island will increase the risk of structural failure of the pipeline which would have serious and unacceptable consequences in PG&E's ability to supply gas to Bay Area customers.

External Corrosion: Structural failure can have many causes. The risk of external corrosion has not been addressed in the DEIR. Corrosion mitigation programs do not guarantee that there will be no corrosion. Especially in the highly corrosive conditions that will likely exist under the proposed cyclic flooding, a much higher level of corrosion monitoring will be required. This monitoring may include various electrical surveys and physical inspections of the pipe condition. Each section of pipeline must be capable of being walked its entire length for survey and inspection purposes. The pipe may require excavation periodic intervals to inspect for external corrosion and the presence of bacteria which result in MIC (microbiologically induced corrosion). Over time,

the pipeline coating will deteriorate and thus require more frequent monitoring for corrosion.

Structural Modifications: The DEIR indicates that because L-57B is concrete coated it can withstand flooding of Bacon Island with no damage. Although the existing concrete coating on L-57B will prevent it from floating to the surface in the event that Bacon Island becomes temporarily flooded, it will not guarantee that the pipeline will remain stable in a continuously submerged environment. Changes in the soil density, adhesion and specific gravity could allow the pipe configuration to shift based on external forces. A long term submerged condition has not been adequately analyzed and presents many uncertainties which cannot be adequately mitigated without relocation.

Levee Stability: The DEIR indicates that levee stability would be monitored at the locations of Gas Transmission Line crossings and that problems would be corrected by Delta Wetlands per Appendix D2 "Levee Design and Maintenance Measure". This document has not been included in the DEIR for PG&E inspection and review. Due to the critical nature of this facility PG&E has a monitoring procedure in place for both the levee crests and the resulting strain in our L-57B pipeline from levee settlement. Both levee crossings on Bacon Island have been shown to have significant existing stress and PG&E is very concerned about additional settlement which will be caused by buttressing of the levees. Existing monitoring equipment may not function properly in a submerged condition while construction work required to replace sections of pipe which are overstressed would be very difficult or impossible in a completely flooded environment. **E15-6 cont'd**

Routine Maintenance: The DEIR indicates that routine maintenance would not impacted by flooding Bacon Island and that inspections could occur during "dry" periods. Although the existing cathodic protection system would continue to operate in a flooded condition, it would be impossible to adequately monitor the performance of this system while the island is flooded. (See External Corrosion). The central concern regards the definition of a "dry" condition and the requirement that PG&E be guaranteed a sufficient "dry" period on a minimum of an annual basis to perform necessary routine maintenance activities. Based on those results, additional time for more detailed investigations as-well-as any repair or replacement work which may be required. Presently there are not specific provisions for these requirements in the DEIR. Delta Wetlands must be required to remove all standing water from Bacon Island and drop the phreatic

surface to below the bottom of pipe depth of L-57B for our maintenance and inspection work for a period of 3 months during each summer.

Line Rupture Repair: The DEIR indicates that PG&E's method of repair for a line rupture inside Bacon Island would be to bore a new line under the island. This method of replacement is not technically feasible. Due to the fact that adjacent Mildred Island is already flooded, any new bore would have to span approximately 3.96 miles from McDonald Island to Palm Tract. This distance far exceeds that which the technology of directional drilling is presently capable. Accordingly, the bores would have to be made in sections off barges and utilize underwater construction techniques to lower and weld the sections together under water. Construction of islands in Mildred and Bacon Island might be required for boring equipment, requiring substantial expense, potentially significant environmental impacts and special federal permits. Because of these expected difficulties, it would likely be more practical to install a new pipeline around both Mildred and Bacon Island. Temporary repair would probably involve underwater construction techniques for the installation of a repair sleeve or new pipeline section. As indicated in the DEIR and previous documentation "Given PG&E's current operating procedures and equipment, underwater repair would not be a feasible alternative if a leak were to occur during water storage." Repair of a line rupture under flooded conditions would be lengthy and would impact PG&E's ability to meet customer needs. **E15-6 cont'd**

Line Rupture during Winter Storage: The DEIR indicates that "there is little likelihood of a line rupturing on Bacon Island when water storage operation coincides with critical gas line operation". This statement is untrue and can be refuted based on the many erroneous assumptions on which it is based.

1. Emergency ruptures can be the result of numerous causes and contributing factors. This pipeline is the single highest pressure pipeline in the PG&E Gas Transmission System and operates up to 2160 psig. Any significant flaw or damage could result in a rupture. As already indicated, external corrosion, third party damage, internal corrosion, metal fatigue, stress, cracking, impact, etc. can lead to a pipeline rupture. It would be inaccurate to conclude that these unforseeable situations would occur only during times when water storage operation is not required.

2. Although annual maintenance work can detect problems, significant time and resources are required to further define corrosion, coating failure or bending stress problems and then repair or replace the affected pipeline sections. Many circumstances could arise when immediate repair is necessary to protect

pipeline integrity, public safety and service reliability, which will not wait until it is convenient for either PG&E or Delta Wetlands.

3. As already indicated, the Delta Wetlands Alternatives do not provide for a guaranteed dry period in which PG&E would have complete access to pipelines on Bacon Island.

4. The statement in the DEIR indicating that "use of the line crossing Bacon Island is only critical during these peak hours or days" is false. Gas Line 57A and Line 57B are integral to PG&E's normal operations of the McDonald Island Underground Gas Storage Field and PG&E's Gas Transmission System in general. The cyclic volumes available from McDonald Island are used to meet PG&E gas customer loads during the winter months and are used to store gas during the warmer months. Since L-57B is PG&E's sole connection to McDonald Island, any interruption would be unacceptable and place PG&E's ability to meet gas demands for our customers at risk. During summer operations, any extended outage would prevent PG&E from filling the storage field to required pressures prior to the winter load season. **E15-6 cont'd**

Impacts and Mitigation Measure of Alternative 1: Gas Facilities and Transmission Pipelines - Summary of Project Impacts and Recommended Mitigation Measures

Impact E-3: Increase in the Risk to Gas Lines Crossing Exterior Levees on Bacon Island

The DEIR indicates that "No mitigation is required" because settlement and erosion monitoring and control measures would be implemented". The specifics of this plan in Appendix D2 were not available in the DEIR for PG&E's review and comment. PG&E's experience with levees on McDonald Island have proven that levee fill work can substantially increase the rate and amount of settlement of delta levees with resulting strain on pipelines at the crossing locations and changes in direction. Significant increase in pipeline strain would require replacement of pipe at areas of high strain. Additionally, levee settlement added to the existing strain resulting from historical settlement increases the likelihood of a pipeline rupture at these key locations.

Impact E-4: Increase in PG&E's response time to Repair a Gas Line Failure on Bacon Island.

The DEIR indicates that "No mitigation is required" because there is little likelihood of a line failure occurring when water storage operations are concurrent with peak gas demands". In fact, this is the most likely time during which a failure would occur due to the fact that most failures are not totally random events. Those not caused by direct 3rd party damage are likely to be caused by corrosion or other pipeline flaw exacerbated by the pipelines environment. Cyclic flooding and drawdown of Bacon Island could contribute to movement of the pipeline or the surrounding soil either across the island or through the levees themselves. The delta levees in general are most vulnerable during the winter months when the water table and hydraulic forces are at their highest. Further, PG&E's "peak" gas demand occurs every year and lasts from approximately November 15 though March 15. Thus at a minimum, one third of the year is highly susceptible to gas transmission interruption as a result of a pipeline rupture.

Because the pipeline is utilized year round, a line rupture will, in all cases, have a significant and unacceptable impact on the operation of McDonald Island and will limit our ability to provide safe and reliable service to our customers. Based on our existing cycles and the possibility for future counter cycles (withdrawal in summer, injection in winter) a pipeline rupture at any time during the year will have a significant adverse impact on the McDonald Island Gas Storage Field. **E15-6 cont'd**

PG&E's ability to repair a rupture of a gas transmission line on Bacon Island when in a flooded condition remains very difficult to predict prior to knowing the exact location and extent of the failure. As indicated, the placement of a new line could not occur by directional boring and access to the existing line would be limited to underwater repair techniques. Our experience with locating and mapping other facilities in the delta prove that the poor visibility underwater and the specialized equipment required would make such an attempt risky, expensive and time consuming at best, if at all feasible.

Additional Items:

Future Plans: PG&E purchased the Rights-of-Ways across Bacon Island for use in the installation of pipelines to transport natural gas. PG&E reserves the right to expand our existing facilities on Bacon Island to increase the pipeline transmission capacity between McDonald Island and our Brentwood Terminal. One of the most likely alternatives for the installation of additional pipeline facilities would be to parallel the L-57A & B corridor across Bacon Island. An "incremental" build of a proposed L-57C would allow PG&E to expand capacity on an "as-needed" basis in the future. The flooding of Bacon Island would make

the installation of a new line in this corridor impossible without guarantees of a significant "dry" period which would allow for pipeline installation and commissioning as well as directional drilling to neighboring Palm Tract and to McDonald Island.

Summary of Gas Transmission Issues:

E15-6 cont'd

The only way to fully mitigate the impacts to PG&E's Gas Transmission pipelines on Bacon Island would be to reroute these facilities across adjacent islands and reconnect them to our facilities on Palm Tract. The increased risk to the integrity of these lines at levee crossings and the limitation in our ability to access the lines for either maintenance or emergency repair is unacceptable to PG&E due to the critical nature of these facilities. Provisions for a guaranteed dry period would allow for inspection, maintenance and minor repair activities to occur on an annual basis but would not address the emergency repair issue or PG&E's right to utilize this existing right-of-way for future expansion.

Update PG&E Distribution List:

Presently there are four PG&E personnel on the distribution list, three of which should be dropped from distribution due to reorganizations and personnel changes.

Please remove:

1. Mr. Shan Bhattacharya - V.P. of T&CS
2. Land Superintendent - PG&E Walnut Creek
3. Mr George Rowe - Northern Pipeline Operations, Antioch

Please keep or add the following people:

Mr. Kim Sloat - Manager
PG&E - Gas System Maintenance
375 North Wiget Lane
Walnut Creek, California 94598

Mr. Frank Dauby - Pipeline Engineer
PG&E - Gas System Maintenance
375 North Wiget Lane
Walnut Creek, California 94598

Mr. Chris Ellis - Land Project Analyst
PG&E - Building and Land Services
5555 Florin - Perkins Road
Sacramento, California 95833

Mr. Rick Moss - Attorney at Law
PG&E - Law
77 Beale Street
P.O. Box 770000
San Francisco, California 94777

Ms. Leslie Day
PG&E - Stockton Division
P.O. Box 93095201
Stockton, California 95201

Mr. Don Murray
PG&E - Diablo Division
1030 Detroit Avenue
Concord, California 94518

Mr. Ron Calvert
PG&E - Transmission Planning
Mail Code N3B
245 Market Street
San Francisco, California 94105

Thank you for the opportunity to comment on this document. If you have any questions regarding this information please do not hesitate to call me at (916) 386-5097.

Sincerely,

Christoffer Ellis
Land Project Analyst

bcc: Ron Calvert
Frank Dauby
Leslie Day
Buck Jones
Loren Loo
Rick Moss
Don Murray
Mike Schonherr
Kim Sloat
Scot Wilson

Pacific Gas and Electric Company

E15-1. Issues regarding the cost and schedule for relocating Pacific Gas and Electric Company (PG&E) facilities are beyond the scope of the NEPA and CEQA analysis for this project and would need to be negotiated privately between Delta Wetlands and PG&E.

E15-2. The terms "transmission" and "distribution" were incorrectly used interchangeably in the 1995 DEIR/EIS. As noted by the commenter, the electrical lines on and in the vicinity of the project islands that are discussed in relation to Alternative 1 on pages 3E-9 and 3E-10 of the 1995 DEIR/EIS (pages 3E-9 through 3E-11 of FEIS Volume 1) should refer only to distribution lines. The same is true of the discussions on page 3E-1 under "Summary", on pages 3E-15 and 3E-16 under the summary of impacts of and mitigation measures for Alternative 3, and on page 3E-19 under the discussion of impacts of the No-Project Alternative (pages 3E-1, 3E-17, 3E-18, and 3E-21, respectively, of FEIS Volume 1) .

It is unknown whether a substantial increase in electrical capacity would be required to serve the proposed Delta Wetlands facilities (siphons, pumps, and recreation facilities). As described in Appendix 2 of the 1995 DEIR/EIS, siphon and pump facilities on the reservoir islands would be powered by either electricity or diesel. For purposes of impact assessment, the analysis of potential project effects on utilities assumed that some increase in electrical service may be needed under project implementation. The 1995 DEIR/EIS assessed the potential effects of project implementation on existing electrical systems serving the project islands, including the possible need for increased electrical capacity to serve new facilities. See Impacts E-5, E-6, E-7, E-19, E-20, and E-21 in Chapter 3E. The following text has been added to Impacts E-6 and E-20:

> It may also be necessary to relocate or upgrade electrical transmission and substation facilities to serve new project facilities; any relocation or upgrade of electrical substation facilities (50,000 volts and above) may require formal approval from the California Public Utilities Commission (CPUC). If, when specific design details are submitted, the CPUC determines that the NEPA and CEQA documentation already completed for the Delta Wetlands project does not cover site-specific environmental impacts in enough detail, it may require additional environmental documentation before providing approvals.

Issues regarding the cost and schedule for relocating PG&E facilities, including any needed changes to existing substations, are beyond the scope of the NEPA and CEQA analysis for this project and would need to be negotiated privately between Delta Wetlands and PG&E.

E15-3. Because there is no scientific consensus on the health and environmental effects of electromagnetic fields, no additional information needs to be added to the analysis. The lead agencies acknowledge PG&E's policy to consider electromagnetic fields in the design, planning, and construction of new facilities.

E15-4. This is not a comment on the environmental effects of the project; no response is required.

E15-5. See response to comment E15-1.

E15-6. The commenter is referring to information and analysis in the 1995 DEIR/EIS that was replaced by the 2000 REIR/EIS. Chapter 7, "Natural Gas Facilities and Transmission Pipelines", of the 2000 REIR/EIS presented an updated description of PG&E's gas facilities and an analysis of potential effects of the Delta Wetlands Project on natural gas pipelines that cross Bacon Island (see Chapter 3E of Volume 1 of this FEIS). The analysis identified mitigation to ensure continued safe operation of PG&E's Line 57-B and potential future operation of Line 57-A where these lines cross Bacon Island. The recommended mitigation includes anchoring Line 57-A if necessary; monitoring levee settlement and subsidence where the pipelines cross the Bacon Island levee and implementing corrective measures to reduce the risk of pipeline failure during levee settlement; providing facilities for annual pipeline inspection; and providing for relocation and access to PG&E's cathodic protection test station.

PG&E submitted comments on the 2000 REIR/EIS; see responses to Comment Letter R16.

Section F. Public Hearing

Public Hearing
WATER RESOURCES CONTROL BOARD
STATE OF CALIFORNIA
and
U. S. ARMY CORPS OF ENGINEERS

---o0o---

Subject:
Public Comments on Proposed Delta Wetlands Project and Draft EIR/EIS

---o0o---

Held in
Auditorium, Secretary of State Building
Sacramento, California

---o0o---

Wednesday, October 11, 1995
10:00 a.m.

A L I C E B O O K
CERTIFIED SHORTHAND REPORTER
24122 MARBLE QUARRY ROAD
COLUMBIA, CALIFORNIA 95310

PHONES: 916 457-7326 & 209 532-2018

HEARING PANEL

--o0o--

ART CHAMP, Chief, Regulatory Branch,
Army Corps of Engineers, Sacramento District

ED ANTON: Chief, Division of Water Rights,
Water Resources Control Board
State of California

--o0o--

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1 **WEDNESDAY, OCTOBER 11, 1995, 10:00 A.M.**

2 **--o0o--**

3 MR. CHAMP: Good morning.

4 I am Art Champ. I am Chief of the Regulatory Branch
5 with the Army Corps of Engineers, Sacramento District.

6 I am here with Ed Anton from the State Board to hear
7 your comments on the Draft EIR/EIS on the Delta Wetlands
8 Project.

9 This project involves modification to four islands in
10 the Sacramento-San Joaquin Delta for the purposes of water
11 storage and habitat improvement.

12 A little later we will hear from Ken Bogdon with a
13 more detailed project description.

14 The Corps of Engineers is involved in this project
15 because of Section 10 of the River and Harbor Act of 1899
16 and Section 404 of the Clean Water Act.

17 Permits are required under these acts for the
18 placement of structures in and over a water of the United
19 States and for fill in waters over wetlands.

20 We determined an EIS under the National Environmental
21 Policy Act would have to be prepared prior to our decision
22 on this project based on its scope and its impacts.

23 We are also currently evaluating endangered species
24 impacts under Section 7 of the Endangered Species Act with
25 the National Marine Fisheries Service and the Fish and

Wildlife Service.

I am joined here today from the Corps of Engineers by Jim Monroe. He is in the back of the room. He is Chief of our Delta Regulatory Office and also the Project Manager on this project; and Dave Tedrick -- I don't see Dave right now -- there he is, who also works in our Delta Office with Jim.

Before we proceed to receive comments, I would like to establish a few rules for the meeting.

First of all, this is not an adversarial proceeding. There won't be any cross-examination of speakers. We want to hear what people have to say. We want your comments on the alternatives, the content and the clarity of the document.

We are not in a position at this time to make a permit decision; therefore, we are not interested in comments with regard to our decision as to whether the permit should be issued or denied at this time. We will be holding hearings later and there will be further opportunity to provide input on the decision that should be made, and that opportunity will occur after the final EIS is distributed.

When you came in you should have received and completed a blue attendance card. If you wish to speak, you should have so indicated on that card. Speakers will be called generally in the order that the cards were received.

If you didn't receive a card, please raise your hand at this time and one will be brought to you.

We need those cards not only for our attendance list but for the speakers.

When you come up to speak, please come to the table at the other side of the stage, state your name and the organization you are representing, and then, summarize your comments.

If you have written comments, please leave them for us and they will be entered into the record. There's no need to read your comments into the record. Written comments will suffice.

The record will be open until November 21 for written comments and I assume everyone knows where to send those comments. I will give the address later on.

At this time, Mr. Anton has some opening remarks also, and then we will hear from Ken Bogdon with a project description, and Mr. John Winther, the President of the Delta Wetlands.

MR. ANTON: Thank you.

I am Chief of the Division of Water Rights of the State Water Resources Control Board.

The State Water Resources Control Board is the State lead agency under the California Environmental Quality Act.

The document that we are looking at is a joint

EIR/EIS with both CEQA and NEPA.

We are involved because the project needs a water right from the State Water Resources Control Board in order to operate its water conservation features.

I do want to urge you to address your comments to the EIR/EIS. There will be a separate water rights proceeding at which we will consider the EIR/EIS as completed and consider all other aspects of a water rights proceeding.

If you are providing lengthy comments, I would urge you to submit them in writing as well. It is much easier for us to deal with them and thoroughly address your concerns if they are in writing.

I also want to mention that we do have a court reporter present and a transcript will be prepared. If you want a transcript, you should make arrangements for a transcript directly with the court reporter.

The State Water Resources Control Board also has several staff that are working on the project here in case you want to talk to them at a later time.

Jim Sutton and Jim Canaday are working on the environmental aspects of the project. We have Dave Cornelius working on the water rights aspect of the project, and Barbara Leidigh, who is our Senior Staff Counsel, working on the particular project.

That's all I have to add at this time.

At this time, we can go to Ken Bogdon from Jones & Stokes, who will tell us a little bit about the project.

MR. BOGDON: I am going to speak from here so I can work the overhead.

Again, I am Ken Bogdon and I work for Jones & Stokes Associates. I'm the Project Manager for preparation of the environmental documents for the Delta Wetlands Project.

Jones & Stokes Associates was hired by the U. S. Army Corps of Engineers and the State Board to prepare all the environmental documents for the Delta Wetlands Project.

I am going to go over two things today. I am going to go over the project description very generally that was analyzed in the EIR/EIS, and then I am going to talk a little bit about the organization of the EIR/EIS.

I want to point out that some of the features of the project are highlighted on posterboards in the back of the room, if anybody wants to look at them and browse through them. We are not going to cover the project description in detail, and also, of course, there's a detailed description in the EIR/EIS.

The Delta Wetlands Project is located on four islands in the Central Delta. These islands are Bacon Island, Bouldin Island, Holland Tract and Webb Tract.

Bacon Island and Webb Tract are called reservoir islands because they are the main features for water

1 storage. The reservoir islands, as I said, Bacon Island and
2 Webb Tract, will involve the diversion and storage of water
3 year round when water is available according to the permit
4 conditions that will be applied to the project, and they
5 will store water for the purpose of discharging for sale to
6 either export or outflow to meet estuary requirements.
7 The habitat islands will involve the seasonal
8 diversion of water to create wetlands and wildlife habitat,
9 and also, enhance wetlands wildlife habitat that exist on
10 the islands.
11 The habitat islands will be managed according to a
12 Habitat Management Plan, an HMP as it is called in the EIR.
13 This HMP was designed to fully compensate for the effects of
14 the reservoir islands on wetland and wildlife habitat.
15 This HMP was designed not only by the scientists at
16 Jones & Stokes Associates, but the State Board and
17 Department of Fish and Game were directly involved in
18 developing the HMP in consultation with the Corps and the
19 Fish and Wildlife Service.
20 Other features of the Delta Wetlands Project include
21 strengthening and improving all the levees of the four
22 islands. They include interlevee systems for shallow-water
23 management on the reservoir islands. During times of non-
24 storage, shallow water will be managed in the interlevee
25 system on the reservoir islands which may have some wetland

benefits.

There will also be recreation facilities located on the perimeter levees of all four islands. These recreation facilities will include boat docks, both for the interior levees and exterior in the channels and they will support boating year round and duck hunting during duck hunting season.

There will also be a private airstrip located on Bouldin Island to support recreation.

There will also be additional siphon and water pumps added to the reservoir islands, Webb Tract and Bacon Island.

The EIR/EIS analyzes four alternatives. Alternatives 1 and 2 analyzed in the EIR/EIS are two variations on the two island reservoirs, two island Habitat Management Plan projects, and those are both considered in the proposed project of the project applicant.

Alternative 3 is a full-capacity alternative and that will include full storage on all four islands with habitat mitigation separate from the four-island project.

There is also a no-project alternative which is a no-permit alternative for NEPA purposes. It's the project as if there would be no permits issued by the State Board or the Corps.

There was a different project proposed by Delta Wetlands in 1987 when they first applied to the State Board

1 and the Corps for their permitting. This project involved
2 all four islands that would have a seasonal water-storage
3 feature, and then, also, a seasonal wetlands feature every
4 year, and this is not the proposed project anymore and is
5 not analyzed in the EIR/EIS.
6 So, to talk a little bit about the organization of
7 the EIR now, the EIR is organized into two volumes.
8 Volume 1 of the EIR/EIS is the actual environmental
9 impact analysis of the EIR and the EIS. It includes a
10 summary which has also a summary table summarizing all the
11 impacts and mitigation measures for all the alternatives.
12 There is a Chapter 1 which is just an introduction.
13 Chapter 2, which is the project description and
14 description of the alternatives.
15 Chapter 3 contains an overview of the impact
16 analysis, the net methodology that's used in the
17 entire document for the resource impact analysis.
18 Chapters 3-A through 3-O are actual resource impact
19 assessments for the different resources analyzed.
20 They go from water supply, water project operations,
21 right down through air quality effects of the
22 project.
23 Chapter 4 is the permit and environmental review
24 requirements that are associated with not only the
25 lead agencies, but also, cooperating and responsible

agency decisions that are involved with the Delta Wetlands Project.

Chapter 5 is a list of the preparers.

Chapter 6 is the glossary chapter.

Seven includes the distribution list for all those who received the EIR/EIS on the initial distribution.

Volume 2 of the EIR/EIS contains technical appendices. These are supplemental information for the different chapters of the project. They are supplemental information on the project description. There is also data on all the modeling that was performed and there's supplemental information on some of the other processes that are going on.

Copies of the biological assessments for the Fish and Wildlife Service consultation and the National Marine Fisheries Service consultation are included as well as a copy of the alternatives analysis for compliance with Section 4 of 4(b)(i).

There is an executive summary that is available and the executive summary is a very general description of the project and the project impacts. It does not summarize the impacts in detail as the summary in the EIR/EIS does.

As was stated already, the purpose of the meeting and the purpose of Jones & Stokes' attendance at this meeting, is to receive your comments. It is not to respond to your

comments.

I did not bring the particular experts who are authors of the different resource chapters here today to respond to questions. We will take back your comments and help the lead agencies prepare a formal response to your comments or questions, and will also assist in amending the Draft EIR/EIS where appropriate.

So, with that, if you need to obtain a copy of the EIR/EIS, there is information on how to obtain that at the desk up there, and if you have any questions in relation to the EIR/EIS process or any other questions on how Jones & Stokes was involved in the preparation of this document, I will be around at the end of the meeting, or you can pick up a card and I will be glad to talk to you.

So, thank you.

MR. CHAMP: Thanks.

MR. BOGDON: If you want to use the overhead here, let me know, and if you need to point out a certain feature of the project, we can put back the overhead with the four islands on it.

Thanks.

MR. CHAMP: Mr. John Winther, President of Delta Wetlands, would like to make a brief statement.

MR. WINTHER: It's normally a cliche' to say I am happy to be here, but after nearly ten years of developing

1 this Delta Wetlands Project, we are clearly in a stage of
2 making great progress.
3 And the first thing I would like to do is thank a few
4 people, the lead agencies, of which you have heard earlier,
5 are the Corps of Engineers, and I would like to thank Jim
6 Monroe, who is hiding out someplace; for the State Water
7 Resources Control Board, Jim Sutton and Jim Canaday, Dave
8 Cornelius, Jerry Johns and Barbara Leidigh.
9 There's been a lot of heavy lifting over the past
10 several years in terms of getting this report out and I am
11 not using that term figuratively, although there is a lot of
12 heavy lifting when you lift the document.
13 I would also like to thank the management and staff
14 at Jones & Stokes -- there's too many to name.
15 As you have heard, Ken Bogdon is the Project Manager
16 and there's dozens of staff people who are specialists and
17 have provided input into the document.
18 The only other part of the overview that I think is
19 important is that when we began this project in 1985, the
20 State -- not just the State Project but the State was short
21 on water supply. In the 11 years that have followed, very
22 little new water has been developed, and I think
23 appropriately the proper minds in the water business have
24 recognized that a good deal of water should have been and is
25 now being applied to the environment, but the demand remains

and we view the Delta Wetlands Project as one that can provide a significant source of new water.

Certainly, it will not solve the problem but will lead toward a solution.

And we are committed, of course, technically we are required, to do it without significant impacts. But we are committed from a business sense to move forward with a water project that is environmentally sensitive and to that end we have been meeting with environmental groups to keep them tuned in to where we are as we move along.

After some difficult starts, when we finally got the right people in the right places with the Department of Fish and Game, we have made great headway with the Department of Fish and Game and we are very proud of the Habitat Management Plan that Ken briefly described.

It is clearly a benefit for wildlife and we are working very hard with the fish agencies to come up with some beneficial programs for fish.

Thank you.

MR. CHAMP: Thank you, John.

I want to reiterate something that Ken Bogdon said.

If you need a copy of the draft document, there is a sign-up sheet at the rear of the room. Please sign up with your name and address and we will make sure one is sent to you.

With that, our first speaker will be Roger Lefeburk.

MR. LEFEBURK: Good morning. My name is Roger Lefeburk and I am First Vice President of the Shasta Lake Business Centers Association.

Businesses directly located or involved on Shasta Lake employ in excess of 650 people, over 200 of which are permanent employees on the lake.

These figures do not account for the residual employment for gas stations, restaurants, grocery and outside services and businesses that support the lake.

Tourism on Shasta Lake, which amounted to 6.4 million visitor days in 1994, is closely related to the water level in Shasta Lake. When the water level is high, like this year in 1995, recreational use of Shasta Lake is also very high. As the water level drops in the reservoir, the tourists go elsewhere.

We view the Delta Wetlands Project as an opportunity to provide a new source of water to downstream demands without putting additional pressure on the water supply in Shasta Lake.

F1-1

It is very important to us that the Delta Wetlands Project is producing wildlife benefits and that there are no fisheries impacts without suitable mitigation measures.

The Draft Environmental Impact Report for the project appears to be very thorough and very comprehensive.

It is our hope that the responsible permitting and regulatory agencies move with this project forward as soon as possible. F1-1 cont'd

Thank you very much for the opportunity to make some comments.

MR. CHAMP: The next speaker will be Liza Allen.

Paul Allen.

MR. ALLEN: I feel like a kid called on too early in the class session.

First, I would like to compliment everybody on a very nice EIR, and a well done, well thought-out EIR.

I am still not sure how I feel about the project, but I do have some questions I would like to see addressed before the permit process goes ahead.

I live on Bradford Island, which is a neighbor of Webb, one of the reservoir islands proposed, and I am worried about the effect of the water table on Bradford Island. I know that historically when a Delta island floods, quite often neighboring islands flood, what we call sympathy flooding. F2-1

I did not see anything but a passing mention of this possibility and what could happen to it, and what would be done if, indeed, Bradford, Hotchkiss or any of the other neighboring islands, were to flood.

My second concern is what sailors call fetch, fetch F2-2

being the effect of weather on a large expanse of water, the greater the expanse of open water, the greater the wind and wave action generated. It would appear that Frank's Tract effect of fetch would be more or less tripled if Webb Tract was flooded.

F2-2 cont'd

And I was wondering if there were, indeed, some studies to find out how much more wave and wind action will be generated, and if there will be some sort of process whereby neighboring islands can apply for relief if their levees are damaged by this wind and wave action.

In the economic and transportation areas, I am very concerned about the Delta Ferry Authority and the ferry operation, whether cessation of agriculture on Webb Tract will mean a corresponding decline in revenues to support the ferry, which is already in a pretty desperate financial condition.

F2-3

My last two items are environmental and economic. Environmentally, I notice the Habitat Management Plan seems to be well thought out, and to have monitoring built into it and involves State and Federal agencies, but the portion on the effect on the fishery is a lot more vague.

F2-4

I would like to see the monitoring of the fishery and effects on the fishery firmed up a bit.

And lastly, I am concerned about additional speed zones necessitated by all of these new mini marinas.

F2-5

You may or may not know people on Bradford Island and a lot of the other islands depend on their boats for transportation to and from work. If, say, for instance, Holland Tract were made into a five-mile-an-hour zone, this would have a very detrimental economic effect on people needing to go back and forth with their boats to work. **F2-5 cont'd**

If you can imagine taking a portion if I-5 and putting in a 30-mile-an-hour zone, this would be similar to what we would experience as boaters on the Delta.

Thank you very much.

MR. CHAMP: Thank you, Mr. Allen.

The next speaker will be Kevin Wolfe.

MR. WOLFE: My name is Kevin Wolfe and I am actually here representing myself.

I have worked for over ten years for Friends of the River. I worked to stop dams like the Auburn Dam project and others, and I have always felt there is a real need for an alternative means by which we can develop water in the state that does not destroy large amounts of river canyon.

And knowing how difficult it is, I have been involved in the augmentation program of the Central Valley Project Improvement Act and know that it is a darn difficult thing to develop water in the State of California at the present time, a lot because of the environmental problems that come from that.

1 I am also working with Friends of the Trinity River
2 and I know that there's going to be some water returning to
3 the Trinity, which means there will be less water flowing
4 down the Sacramento and less water flowing to the Delta in
5 the future, and the ongoing future of the Delta is that
6 there's going to be ever-increasing environmental
7 restraints, at least that's my feeling on it.
8 Within that context, it seems like the Delta Wetlands
9 Project offers a real ray of hope for how to resolve some of
10 these problems. For one thing, I think the biggest is the
11 flexibility in operations, that it can turn on and off very
12 quickly. It can fit that niche when the water is there, it
13 can also be pulled out and stored for later. It doesn't
14 require the massive amount of changes in the South Delta
15 that Los Banos or the Kern County water bank, or an
16 increasing amount of pulling out of water from the South F3-1
17 Delta when the high water comes up and the entrainment that
18 happens in pulling the water south, so that within the
19 overall context of what is the future of the Delta, having
20 water stored in the center of the Delta and being able to be
21 put on those islands, it seems to be a very sound management
22 and way of handling future problems.
23 I think the Delta Wetlands also offers monitoring
24 benefits. Here we are, I am working with the water on line
25 projects and we are doing an in-depth index of all the data

that's in the Delta, and there's an awful lot of data in the Delta, and yet, we still don't know when are the smelt traveling, where are they, how do your operations affect the different endangered species as they pass through, and it seems we need continuous monitoring and sophisticated monitoring, and database and modeling, and the Delta Wetlands right smack in the middle offers and commits to that kind of monitoring.

Within that, you know, it could be integrated and I understand there is a commitment to integrate their efforts within the overall State and Federal efforts as to what's happening in the Delta, and I think that's a benefit that should be taken up on. **F3-1 cont'd**

And so, in theory, when the young smelt are traveling at a certain time, you turn off the pumps and you don't pump into the islands and that kind of effort is needed all over the Delta.

How do the fish travel? What is the overall biology, especially of the endangered species?

And then, the adoptive management plan part of it, that it can adapt over time. That is, you can determine if the Delta is global, weather conditions change and there is a significant possibility that that can happen in the future, and that if we do start getting more rain in the winter during the snowpack and getting more floods coming

1 down in the winter, we are going to need to have the
2 capability of pulling out more water when the water is
3 higher in those short periods of opportunity. That's again,
4 a benefit of having island reservoirs in the middle of the
5 Delta.
6 Within that context, well then, we have what is the
7 future of the Delta islands? Having studied this for ten
8 years and knowing they are oxidizing and going away at two
9 inches plus a year, what is going to happen to the Delta
10 islands? Who's got the money to fix up those island
11 levees? No one has the money.
12 And the agricultural future is not secure at all
13 there. As these winters get worse, if they do, or an
14 earthquake happens, or whatever happens, those islands are
15 going to go down all over, and then what do we have? A
16 giant pool of water smack dab in the Delta.
17 You talk about wind-erosion problems. Great! Knock
18 down some of the levees and then see what happens.
19 And within this context no one is committed to fix
20 the levees and there is no money to fix them, and
21 agriculture does not have the money to fix levees and they
22 are looking for a handout from the Federal and State
23 Governments.
24 The State and Federal Governments are not going to
25 fix the levees, so who is going to fix them? Well, private

F3-1 cont'd

industry, in making those reservoirs, is committing to fix the levees like no one else will fix them, and that is something that should be seriously emphasized.

If there is not a Delta Wetlands Project in the Delta, who is going to fix the Delta levees? And if there is no answer to that, then go with the people who will fix them.

So, the habitat benefits, of course, seem to be highly important, 9,000 acres of wetlands habitat, managed for wetlands habitat, not just rice fields at the end of the season managed as an adjunct to the rice fields, but two islands pretty much dedicated to wetlands habitat in a critical area in which historically that's where the wetlands were. **F3-1 cont'd**

The vast majority of the wetlands were right along in that Delta and a lot of it is gone. And putting it back in there seems to be filling a very important hole in the Pacific Flyway where the wetlands should be occurring.

So, I am very positive about that, and the recreational benefits that come with it; the sophisticated fish screens, the need for fish screens on every island in the Delta. We have got all this pumped onto Delta islands and we don't have fish screens on most of those islands, so we have got problems there.

We have organic and the trihalomethane precursors

coming off the islands. We have problems with existing agriculture in the Delta that's not being resolved, and so, we have a project that can resolve, not perfectly but an awful lot of those problems, and I see it as a win-win all the way down the line. **F3-1 cont'd**

And I am very enthusiastic and see it as a breakthrough in how does California start resolving its water problems, getting at the real water in a manner that benefits the environment.

So, those are my overall comments. Thank you.

MR. CHAMP: Thank you, Mr. Wolfe.

That is the last of the speaker cards. Is there anyone else who would like to speak at this time?

Do you have any further comments?

MS. ALLEN: I do have one comment and that is that Webb Tract is now used for agriculture, and over the years there's been a lot of herbicides, fertilizers, pesticides used, and I am wondering if the island is flooded, then where do all those pesticides, et cetera, go? What happens to them in the water, as well as, as my husband was saying about the water table possibly coming up on Bradford Island and the other islands? **F4-1**

MR. CHAMP: Thank you, Ms. Allen.

Okay, if there are no further comments, I would like to adjourn this portion of the hearing.

I would remind you that we will resume at 7:00 p.m. tonight for additional comments.

Also, I would like to remind you that written comments can be submitted until November 21 to the Corps of Engineers or the State Water Resources Control Board, and those addresses are in the notices that announced this meeting.

So, with that, I will adjourn this part of the meeting.

(Adjournment until 7:00 p.m.)

WEDNESDAY, OCTOBER 11, 1995, 7:00 P.M.

--OOo--

MR. CHAMP: My name is Art Champ, Chief of the Regulatory Branch for the Corps of Engineers, Sacramento District.

This is a continuation of the public meeting on the Delta Wetlands Project.

Do we have any speakers in the audience?

Okay, since we don't have any speakers present, I am going to close the public meeting.

The record will remain open until November 21 for written comments.

Thank you.

(Proceedings concluded)

REPORTER'S CERTIFICATE

---o0o---

This is to certify that I, ALICE BOOK, a Certified Shorthand Reporter, was present during the Public Hearing of the **WATER RESOURCES CONTROL BOARD, STATE OF CALIFORNIA**, and **U. S. ARMY CORPS OF ENGINEERS**, held in Sacramento, California, on **October 11, 1995;**

That as such I recorded in stenographic writing the proceedings held in the matter of **Comments on Proposed Delta Wetlands Project and Draft EIR/EIS.**

That I thereafter caused my said stenographic writing to be transcribed into longhand typewriting and that the preceding 23 pages constitute said transcription;

That the same is a true and correct transcription of my said stenographic writing for the date and subject matter hereinabove described.

Dated: October 17, 1995

Alice Book

ALICE BOOK

Roger Lefebvre (Shasta Lake Business Owners' Association)

F1-1. The lead agencies acknowledge this comment supporting the project. Because these statements do not specifically comment on the environmental analysis in the 1995 DEIR/EIS, no response is required.

Paul Allen

F2-1. The potential effects of the Delta Wetlands Project on seepage on adjacent islands were addressed in Chapter 6 and Appendix H of the 2000 REIR/EIS. See Chapter 3D in Volume 1 of this FEIS

F2-2. See response to Comment E8-3 regarding the effect of wind-generated waves on the Delta Wetlands Project islands and response to Comment E8-5 regarding the establishment of an escrow account.

F2-3. See Chapters 3E and 3L and responses to Comments C13-6, C13-7, C16-1, and E8-1 regarding the effect of the Delta Wetlands Project on the Delta Ferry Authority.

F2-4. Since the 1995 DEIR/EIS was completed, the lead agencies have concluded formal consultation with DFG, NMFS, and USFWS on the effects of the Delta Wetlands Project on listed fish species. As part of the consultation process for compliance with the federal and California ESAs, USACE, the SWRCB, NMFS, USFWS, DFG, and Delta Wetlands agreed on the measures referred to as the FOC. The FOC specify parameters for diversion and discharge operations, allowable effects on channel temperatures, fish-screen design, construction restrictions, monitoring procedures, and other conditions of project operation. The FOC have been incorporated into the proposed project. See Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for details about the formal consultation and discussion of the FOC and RPMs in the biological opinions subsequently issued by DFG, NMFS, and USFWS.

F2-5. See response to Comment E8-2.

Kevin Wolfe

F3-1. The lead agencies acknowledge this comment supporting the project and reiterating the beneficial impacts identified in the 1995 DEIR/EIS. Because these statements do not specifically comment on the scope or content of the environmental analysis in the 1995 DEIR/EIS, no response is required.

Liza Allen

F4-1. The potential for presence of pesticide residues and waste disposal that remains on the reservoir islands was addressed in Appendix C6, "Assessment of Potential Water Contaminants on the Delta Wetlands Project Islands", of the 1995 DEIR/EIS. See responses to Comments C9-41 and E8-4 for more information.

Chapter 4. Comments and Responses to Comments on the 2000 Revised Draft Environmental Impact Report/Environmental Impact Statement

Chapter 4. Comments and Responses to Comments on the 2000 Revised Draft Environmental Impact Report/Environmental Impact Statement

This chapter contains the comment letters received on the 2000 REIR/EIS followed by responses to those individual comments. Far fewer parties commented on the 2000 REIR/EIS than on the 1995 DEIR/EIS. Comment letters on the 2000 REIR/EIS are organized alphabetically by the name of the commenter (agency or individual).

Each letter and each comment within a letter have been given a number. Responses are numbered so that they correspond to the appropriate comment. Where appropriate, responses are cross-referenced between letters or with a master response.

Changes to the text of the 2000 REIR/EIS that are made in response to comments are shown with a line through the text that has been deleted (~~strikeout~~) or double underlining where new text has been added. These changes have been incorporated into the corresponding chapters in Volume 1 of this FEIS

Table 4-1 provides a list of all agencies and persons who submitted comments on the 2000 REIR/EIS.

Table 4-1. List of Comment Letters on the 2000 REIR/EIS for the Delta Wetlands Project

Commenter	Date	Letter number
California Department of Conservation	07/31/00	R1
California Department of Water Resources	07/31/00	R2
California Regional Water Quality Control Board, Central Valley Region	07/20/00	R3
California Urban Water Agencies	07/31/00	R4
California Waterfowl Association	07/26/00	R5
Central Delta Water Agency et al. (Nomellini, Grilli & McDaniel)	07/27/00	R6
Contra Costa County Community Development Department	07/26/00	R7
Contra Costa Water District	07/31/00	R8
Delta Protection Commission	07/31/00	R9
Delta Wetlands Properties (Ellison & Schneider)	07/31/00	R10
East Bay Municipal Utility District	07/31/00	R11
East Bay Regional Park District	07/28/00	R12
Ironhouse Sanitary District	07/24/00	R13
Metropolitan Water District of Southern California	08/07/00	R14
Natural Heritage Institute	07/16/00	R15
Pacific Gas and Electric Company	07/31/00	R16
Bob Raney (Bethel Island property owner)	07/12/00	R17
Reclamation District #830	07/24/00	R18
Bradford Reclamation District No. 2059	07/28/00	R19
State Water Contractors	07/31/00	R20
City of Stockton (McDonough, Holland & Allen)	07/31/00	R21
U.S. Department of the Interior	08/17/00	R22
U.S. Environmental Protection Agency, Region IX (Federal Activities Office)	08/06/00	R23

State of California **The Resources Agency**

MEMORANDUM

To: Project Coordinator
Resources Agency

Date: July 31, 2000

Mr. Jim Sutton
State Water Resources Control Board
Division of Water Rights
901 P Street, P.O. Box 2000
Sacramento, CA 95812-2000

From: **Department of Conservation**
Office of Governmental and Environmental Relations

Subject: Revised Draft Environmental Impact Report/Environmental Impact Statement (DEIR/DEIS) for the Delta Wetlands Project, Contra Costa and San Joaquin Counties - **SCH #1995093022**

The Department of Conservation's Division of Oil, Gas and Geothermal Resources (Division) has reviewed the above referenced project. The Division supervises the drilling, maintenance, and plugging and abandonment of oil, gas and geothermal wells in California. We offer the following comments for your consideration.

The cover letter accompanying the DEIR/DEIS does not indicate that project impacts on natural gas exploration and development in the area will be addressed. However, failure to analyze project impacts on oil and gas resources will result in an incomplete environmental document.

Several wells have been drilled in the areas proposed by the project for water storage and wetlands establishment. Presently, two wells are producing natural gas on the Webb Tract. (In 1999, the combined production of these wells was 1.1 billion cubic feet of gas). Two additional wells have been approved for future drilling on the Webb Tract.

R1-1

Although natural gas exploration has occurred within these islands with marginal success, the Delta area, in general, is a fertile area for natural gas production and exploration. It is reasonable to expect these islands will continue to be prime locations for drilling. Therefore, consideration should be given to mitigation measures that will allow future exploration and development of natural gas on these islands.

If the project is implemented as proposed, the records of the wells that have been drilled within the project areas should be reviewed to determine if well reabandonment would be necessary. Also, if these previously plugged and abandoned

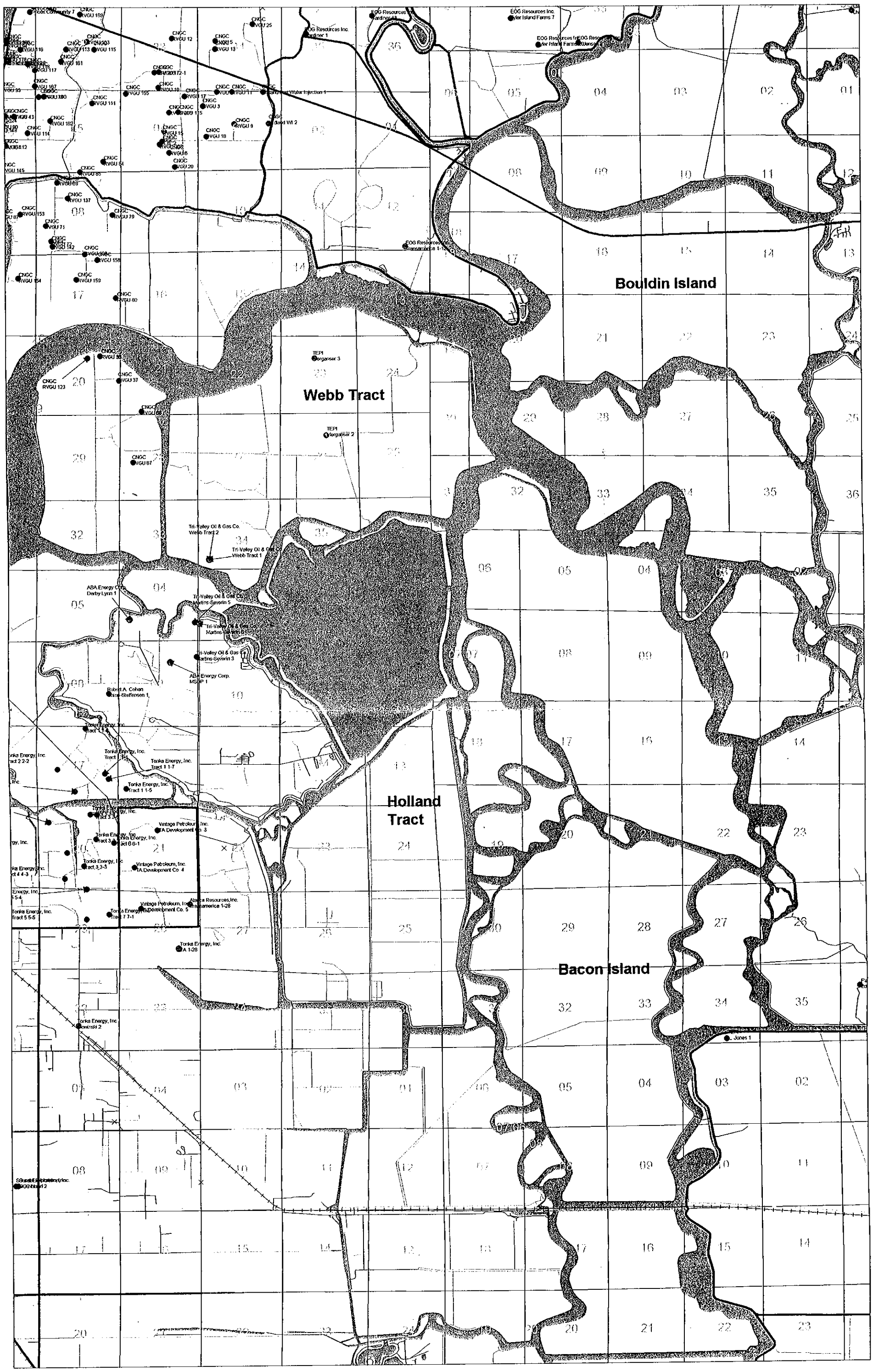
wells are within areas where project related excavation is to occur, well reabandonment of the top portion of the wells may be necessary, particularly if well casings are damaged or cut off to a depth below ground level. **R1-1 cont'd**

Thank you for the opportunity to comment on the DEIR/DEIS. If you have questions on our comments, or require technical assistance or information on gas wells, please contact Bob Reid at the Sacramento district office: 801 K Street, 20th Floor, MS 20-22, Sacramento, CA 95814-3530; or, phone (916) 322-1110. You may also call me at (916) 445-8733.

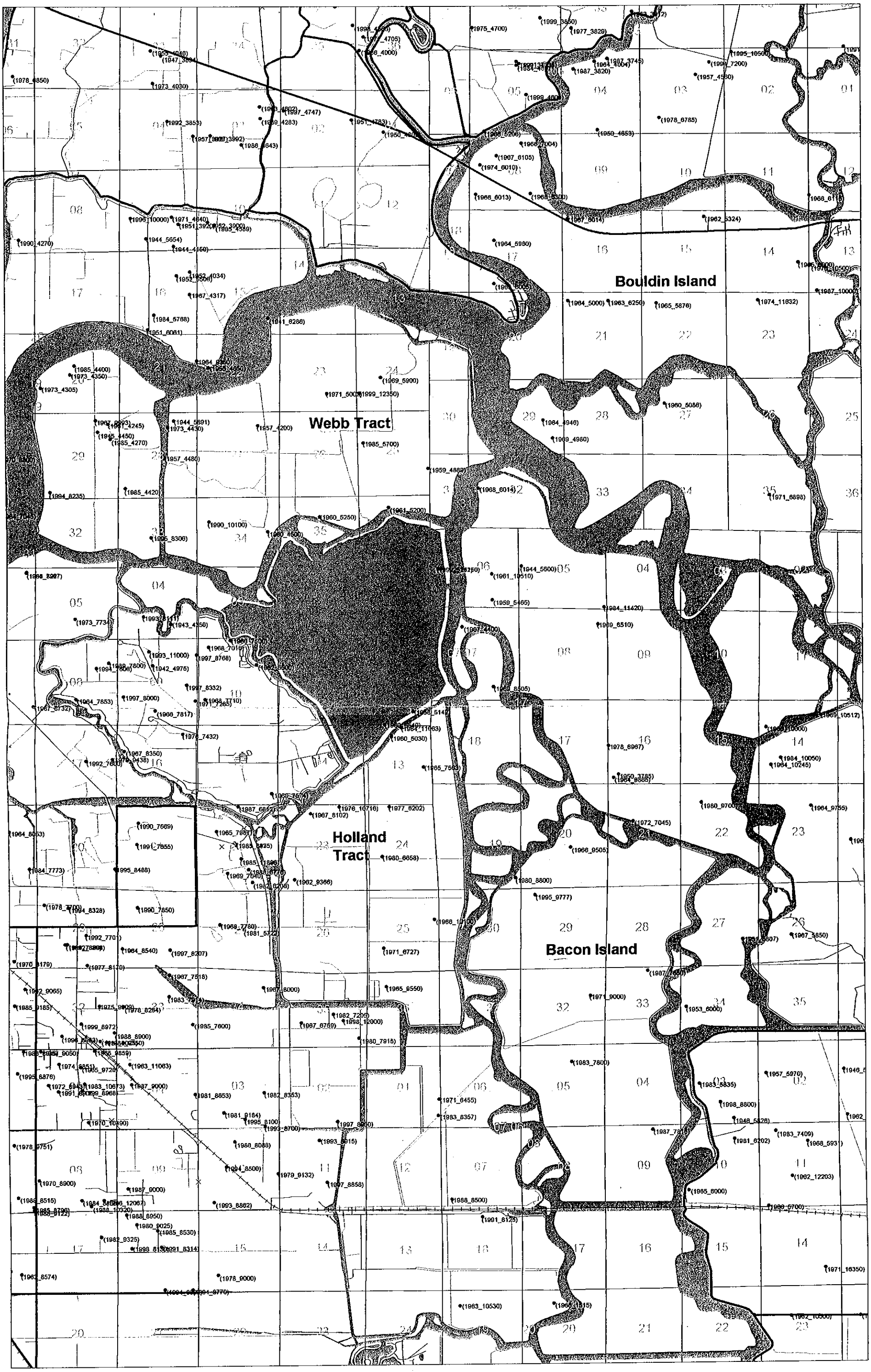
for Jason Marshall
Assistant Director

Enclosure: map with well locations

cc: Bob Reid
Division of Oil, Gas, & Geothermal Resources, Sacramento
Linda Campion
Division of Oil, Gas, & Geothermal Resources, Sacramento



PRODUCING WELLS



4-6

Previously Plugged and Abandoned Wells

California Department of Conservation

R1-1. The issue of project effects on oil and gas resources, including natural gas wells, was addressed in the 1995 DEIR/EIS. As described in Chapter 3E, "Utilities and Highways", implementation of the Delta Wetlands Project would not affect the potential for gas exploration on the project islands; mineral rights would not change from current conditions, and future proposals to drill on the islands would be subject to environmental review by the county and by the California Department of Conservation under an oil or gas well permit. Therefore, inundating the reservoir islands would not preclude future natural gas exploration.

The California Department of Conservation, Division of Oil and Gas, oversees the construction, operation, and closure of wells used to tap oil, gas, and geothermal resources. Although storage of water on Webb Tract would not preclude future natural gas exploration, it may require that existing producing wells be abandoned, and that abandoned wells be evaluated to determine whether reabandonment is necessary. During the final design of the proposed project, Delta Wetlands would need to work with the Division of Oil and Gas and existing mineral rights holders to determine whether wells located on the project islands need to be abandoned or reabandoned. Abandonment of wells would be completed in compliance with Division 2, Chapter 4 of the Public Resources Code, which governs the regulation of oil and gas resources, and Title 14, Division 2, Chapter 4 of the California Code of Regulations, "Development, Regulation, and Conservation of Oil & Gas Resources".

Letter R2

STATE OF CALIFORNIA -- THE RESOURCES AGENCY

GRAY DAVIS, *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

RECEIVED
AUG 0 2 2000

Mr. Mike Finan
U.S. Army Corps of Engineers, Sacramento District
Regulatory Branch
1325 J Street, Room 1480
Sacramento, California 95814-2922

Dear Mr. Finan:

The Department of Water Resources has reviewed the "Revised Draft Environmental Impact Report/Environmental Impact Statement for the Delta Wetlands Project" (May 2000) and submits the attached comments. Our comments address issues discussed in the REIR/EIS that we believe need additional information and analysis to more fully understand the potential environmental impacts of the proposed project. We hope these comments are useful in evaluating and responding to the Department's concerns.

If you have any questions about our comments, please contact me or John Pacheco of my staff at (916) 653-6426.

Sincerely,

Katherine F. Kelly, Chief
Office of State Water Project Planning
(916) 653-1099

Enclosure

Same letter sent to:

Mr. Jim Sutton
State Water Resources Control Board
Division of Water Rights
Post Office Box 2000
Sacramento, California 95812-2000

California Department of Water Resources
Comments on the Delta Wetlands Project
Revised Draft EIR/EIS
July 31, 2000

The Department of Water Resources reviewed the Revised Draft EIR/EIS for the Delta Wetlands Project (May 2000) ("REIR"). Below are comments made by DWRs' Division of Planning and Local Assistance, Division of Operations and Maintenance, Office of State Water Project Planning, Division of Safety of Dams, Environmental Services Office, and Division of Engineering. These comments address specific areas of concern with respect to of water quality, fish, and Delta Wetlands Project design and operation.

In addition, DWR believes that the FEIR should include information with respect to a comparison of alternative locations for reservoir islands that would achieve the same purpose of the selected sites at Bacon Island and Webb Tract. The California Environmental Quality Act requires lead agencies to consider alternative locations where other locations could avoid or substantially lessen significant effects (CEQA Guidelines Section 15126.6.). By considering other alternative storage sites in the Delta, potential significant impacts to drinking water supply, water quality in the Delta, seepage to neighboring islands, and stability of Delta levees may be avoided or lessened.

In 1999, the SWRCB and U.S. Army Corps of Engineers, as lead agencies for the DW Project, held several meetings to discuss issues in preparation of the REIR. During the meeting, DWR presented information on the CALFED Integrated Storage Investigation (ISI) program. The REIR discusses the ISI program and its relationship to the DW Project. DWR staff is developing information on three in-Delta storage options for the ISI. These options are: (1) DW Project Islands using Webb Tract and Bacon Island; (2) CALFED In-Delta Project using Bacon, Woodward, and Victoria Islands; and (3) Southeast Delta Islands Project using McDonald and Victoria Islands and Upper and Lower Jones Tracts. DWR will complete a reconnaissance level analysis of these three options by late August 2000. The analysis will provide preliminary comparison on the feasibility of the islands for meeting water supply needs and concerns with environmental impacts and water quality concerns. The lead agencies for Delta Wetlands should also consider this information on these islands in relationship to the feasibility of the proposed Delta Weltands project and the alternatives analysis for that project. **R2-1**

Division of Planning and Local Assistance

The Division of Planning and Local Assistance (DPLA) reviewed Chapter 4 of the REIR with focus on the impacts from the Delta Wetlands Project discharges on levels of

Total Organic Carbon/Dissolved Organic Carbon (TOC/DOC) and Trihalomethane (THM) formation potential in the Delta channels and at the export pumps.

In general, the difficulties with predicting the water quality in the proposed Delta Wetlands (DW) reservoir islands, especially TOC/DOC concentrations and loads, require careful development and adoption of mitigation measures. Results from DWR's Special Multipurpose Applied Research Technology Station (SMARTS) experiments showed that water quality in terms of TOC/DOC, THMFP, EC, and nutrients can vary significantly depending on a variety of conditions that include time of flooding, duration of storage, water depth, surface water exchange rate, peat soil characteristics, and algal productivity.

Additional information is presented below and is provided to correct technical errors or potential misinterpretations about the referenced studies and salt and organic carbon budgets described in the REIR. Our recommended changes further support the need for mitigation measures in view of the complexities and uncertainties of predicting the water quality of the proposed DW Project. If the Project is approved, it may be prudent to construct and operate the four-island project in stages. Initial work could begin on the habitat islands and one reservoir island. The one reservoir island should have water quality monitoring during the stages of filling, holding water, and discharge to better understand EC and TOC/DOC levels prior to operating the second reservoir island. These actions would reduce the risk of having to mitigate two filled reservoirs at the same time. R2-2

The first set of comments below focuses on the potential impacts of organic carbon loading from the project and not on THM formation impacts at treatment plants or salinity. DPLA has recommended further analyses to help respond to questions concerning carbon loading, which would also assist in calculating relative contributions of these other constituents at the export pumps and to satisfy concerns of water quality impacts. The second set of comments focuses on the use of Municipal Water Quality Investigations (MWQI) SMARTS data and other water quality elements within the REIR.

I. SIGNIFICANCE CRITERIA FOR DOC

The original Draft EIR (DEIR) presented projected concentration data for constituents in the stored water that was widely unaccepted, and much of the testimony at the 1997 water rights hearing on the DW Project focused on this disparity. Though presented briefly in the DEIR, the REIR gives extensive support to justify the significance criteria of 20 percent change in the numerical limit of a water quality variable or change in the mean value for a variable without a numerical limit. This extensive new documentation gives rise to a more detailed look at this criteria. DPLA believes the approach used in the REIR is faulty and fails to provide an approach that could better describe the potential impacts of the DW Project to water quality at the export facilities in the Delta.

The REIR (and DEIR) proposes using the average or mean value of a simulated export DOC concentration of 4 mg/l and allowing a 20 percent increase before a significant impact occurs. This criterion would allow an average increase in the delta export values of 0.8 mg/l of DOC.

A. Concern with Using Simulated Average Export DOC Concentration

DPLA has concerns with using the average or mean export concentration of 4 mg/l DOC and allowing a 20 percent increase to determine if a significant impact occurs from DOC loading for the following reasons:

1. The REIR notes that total delta lowlands contribute 40 percent of export carbon at the southern export facilities. Using the 4 mg/l average, delta lowlands, including Bacon Island and Webb Tract, contribute 1.6 mg/l of the 4 mg/l average concentration. DW suggest that its increased contributions can equal an increase of 50 percent of all delta drainage contributions at the pumps before the impact is significant.

2. Data from DWR's consultant Marvin Jung, to be published in his forthcoming report #3, "Water Quality Benefits from controlling Delta Island Drainage" (Marvin Jung, Fall 2000), show a modeled potential reduction in agricultural drainage of 60 percent from candidate regions in the delta that could equal approximately a 0.8 mg/L decrease at the pumps. In addition, a document with related information, "Candidate Regions for Treatment to Reduce Organic Carbon Loads," was provided to the DW staff. Estimated costs to meet this goal of reducing carbon by 0.8 mg/l at the facilities using treatment are $278-411 million for capital costs, with an annual cost O&M cost of $11 million. This information highlights the potential costs associated with changes in carbon and the effect of the REIR significance criterion of 20 percent. This criterion would allow the DW project to add up to 0.8 mg/l carbon at the pumps with no mitigation. **R2-3**

3. Targets (CALFED)

   CALFED has set forth a plan for the Delta in its June 9, 2000 "California's Water Future: A Framework for Action". The water quality program in CALFED has set target goals of 3 mg/l for total organic carbon (not DOC). Analysis of MWQI Data at Banks shows the current probability of exceeding this standard for DOC is 68 percent (Bruce Agee May 2000- MWQI Delta Workshop). An additional 0.8 mg/l will further reduce the ability to meet this goal. **R2-4**

4. Habitat Restoration (Cumulative Impacts)

   CALFED has identified as a concern potential changes in the amount and seasonality of carbon loading at the pumps due to possible CALFED tidal and seasonal wetland restoration projects in the Delta. DW has not modeled the

seasonal or potential additional loads of carbon from the two proposed habitat restoration islands. Conversely, there is also a belief that seasonal wetlands on Delta islands could help improve carbon loading at the pumps by holding late winter/early spring water on the islands in seasonal wetlands. The proposed criterion does not take into account the potential changes in the water quality due to the operation of the two restoration islands.

Tables 2-2 and 3-9 state that there will be no discharges for export or rediversion from the habitat islands to the reservoir islands but Table 2-1 states there will be a maximum discharge of 200 cfs. While this discharge is relatively small, the water will certainly be part of the exportable water in the channels and there is the potential of high concentrations of salts, nutrients, and organic carbon in the habitat island discharge. Shallow tank experiments (2 ft. water depth) conducted at the DWR SMARTS facility showed there could be high buildup of EC, TOC/DOC, and nutrients under conditions of low water exchange in shallow flooded islands. There should be a brief discussion of the habitat island discharges and loads in the REIR. **R2-5**

5. Other Projects

No discussion is presented of cumulative impacts regarding the Sacramento Regional treatment Plant 2020 master plan, the Tracy Hills wastewater project, and the City of Tracy Wastewater expansion plans. Whether these are required, as part of the cumulative impact assessment for the REIR is a matter of interpretation based on CEQA guidelines. Regardless, all of these projects have the potential to incrementally increase carbon at the export facility, along with the DW project. Since the SWRCB can review and examine a broad range of issues when issuing water rights permits, these cumulative impacts should be considered. **R2-6**

6. CVRWQCB/SWRCB Development of Drinking Water Policy

In 1999, meetings were held as part of the Triennial review of the basin plan. Testimony was presented to the CVRWQCB on the disconnect between the Clean Water Act and the Safe Drinking Water Act. Funding has been provided for the SWRCB to develop a policy relating to drinking water standards in the Delta. This includes the investigation of carbon loading from permitted sources. This supports the effort to identify loading of all carbon in the Delta with a TMDL approach, and the relative impact to the beneficial use of the water.

The DW project may provide a maximum of 3 to 4 percent of the total water exported through pumps from the Delta, yet the REIR states that the project can increase the total carbon loading at the pumps up to 20 percent without a significant impact. This inequity has the potential to significantly impact the beneficial use of water by other water users and needs to be addressed by the EIR process. **R2-7**

B. Recommendation to Use Common Units of Measure and Clarification of Information

During post-hearing meetings with Delta Wetlands, Jones and Stokes, and SWRCB staff, the MWQI Program staff requested that carbon loading be described in common units of measure, such as pounds per day or Kg per day in the channels and at the pumps under different modeling regimes. The REIR does not present carbon loading based on common and acceptable units of measure. Much of the documentation in the REIR discusses rates of loading per square meter of land surface area, and then changes to loading rates per cubic meter of storage. The discussion of exports is also confusing because at times it is not clear whether the discussion is in regard to DW exports or Delta pumping exports. R2-8

Additionally, all MWQI and USGS data used have been converted to a loading rate of grams per meter squared. DPLA found the documentation in the REIR mostly relies on a text discussion, with limited documentation on conversion of existing data. In addition, it was difficult to verify the validity of the loading assumptions. Many of the time series graphs are so compressed they are difficult to read and interpret. True loading numbers and quantified loading by month in comparison should be presented for the channels and the pumps under various scenarios and hydrological years. Conversion formulas should be provided in the appendix.

C. Recommended Approach For Development and Analysis of Potential Significant Impact from Changes in DOC

Because of the concerns with using the simulated average export DOC concentrations of 4 mg/l, DPLA recommends a different approach to the significance criterion for DOC. The REIR acknowledges that the comprehensive loading study on Twitchell Island is one of the most definitive to date. We suggest the following approach using information from the Twitchell Island study and existing data already reviewed by the DW project.

1. Use 1995 monthly discharge volumes from Twitchell to calculate a per acre rate of drainage volume discharge for a typical delta island with similar land use in 1995. If other drainage volume estimates for Bacon are available and preferred then these could also be used.

   Use the following formula to provide a baseline condition for Bacon for a 1995 water year. R2-9

   > " Monthly discharge volume per acre X Bacon Island Acreage X 1995 Bacon island actual DOC concentrations = mass loading per month for the baseline condition for 1995 "

2. Calculate the range of concentrations from the proposed storage option using the referenced range of carbon values from testimony at the hearings. Also use a range of carbon values based on times of filling. Use 1995 year as a scenario.

3. Model the percentage by month of drain volume that leaves Bacon and Webb islands and reaches the export facilities, including CCWD, the SWP and CVP. Calculate, for the baseline or existing condition, the loading in pounds or kilograms per month at the pumps, and the percent of the total loading at the pumps. Calculate the same information based on operating criteria for the storage project.

4. Calculate the percentage difference for each month in carbon loading at the pumps between the existing condition loading and the storage project loading, as well as the concentration impact. This is where the significance of impact can be evaluated. A 10-20 percent difference between the baseline land use condition loading totals and the storage option loading totals might be more realistic as significance criteria for impact. The project should only be compared to itself when calculating the change in percentage of loading. For example: if Bacon Island under a normal baseline condition contributes 0.1 mg/l at the pumps, then the storage project could contribute 0.12 mg/l before it would be considered significant under a 20 percent rule (an additional 0.02 mg/l could be added). **R2-9 cont'd**

5. Using the existing historical MWQI Data for the export facilities, calculate the probability of exceeding the 3.0 mg/L CALFED target for carbon with the change in loading at the pumps.

Using the above approach, and modeling additional years would provide the reviewers with a comparative approach to assess the significance of the impact due to changes in DOC.

D. Mitigation of Impacts from Changes in DOC

The above sections explain the problems of using the REIR method to determine impacts from DOC loading and the importance of considering the timing of loading (seasonality). Tables 4-20 through 4-22 in the REIR show the potential to exceed even the unacceptable 0.8 mg/l significance criteria under various filling carbon concentration values. In addition, as discussed above, it is difficult to evaluate the units of carbon loading for filling and discharging the reservoir using the g/m2/month units. In Table 4-21 of the REIR, the mid-range filling DOC value (4 g/m2/month) results in an average loading of 0.82 mg/L in June and 0.53 mg/L in July. The export water of the SWP and CVP traditionally experience lower DOC concentration during these months. If pumps are running during these months, the contribution from Delta Wetlands at the pumps might exceed the 20 percent criteria for the month. This highlights the importance of evaluating the impacts based on the seasonality of exports.

Mitigation should be based on specific periods of export to municipal and industrial water users as loading exceeds the baseline condition for the four Delta Wetland islands by 10-20 percent. For example, if the existing land use for the four islands contributes a total 0.2 mg/l at the export facilities for the month of July, then significance criteria could be set at 20 percent of this baseline condition, which would be 0.04mg/L. Therefore for this example, if the net change for July is less than 0.04 mg/l at the export facilities (CCWD, Banks, Tracy) then no mitigation is required. If the change were greater than 0.04 mg/L, Delta Wetlands would be required to reduce their loading by controlling discharges to the channels from the four islands. **R2-10**

The REIR shows that under the 0.8 mg/l significance criteria that metering the discharge of water would require a long period of time in order to meet the criteria under certain hydrological conditions. The proposed significance criterion of 20 percent of the existing monthly load suggested in DPLA's comments is much more stringent. A monthly comparison of net change in loading versus export amounts would provide the seasonality of loading, and allow a true estimate in the net change in carbon delivered to users.

II. DISSOLVED ORGANIC CARBON AND SALT BUDGETS FOR DELTA ISLANDS (pg 4-16)

The statement, "The concentrations of dissolved substances in drainage will vary because of dilution by rainwater or increases from evaporative losses." overly simplifies the salt budget. The REIR would be more technically correct to include the following information:

Terms for the salt and organic carbon budget and processes are more complex than stated and are different between salts and DOC. For dissolved minerals that affect EC, the processes of ion exchange, precipitation, resolubilization of mineral compounds, adsorption, desorption, and oxidation-reduction reactions will also cause variations in the salt budget. For dissolved organic matter, the physical, chemical, and microbiological breakdowns or transformations of particulate organic matter in the soil and drain water will increase the dissolved organic concentrations and alter its composition in the drainage water. **R2-11**

At least seven factors determine the water quality in agriculture drainage (Bower, 1974):

1) ratio of surface water runoff water to water moving through the soil (percolated water)
2) applied water quality

3) applied chemical soil amendments
4) drainage fraction
5) mineral and salt solution and precipitation
6) cation-exchange, adsorption, and oxidation-reduction reactions in the soil
7) removal of soil solutes by crops

The primary sources of soluble salts in agricultural soils are (Rhoades, 1974):

- applied irrigation waters
- salt deposits in soil parent materials before farming occurred
- surface and subsurface agricultural drainage waters draining from upper-lying to lower-lying lands
- shallow water tables

Additional secondary sources of salts include:

- applied fertilizers, soil amendments, and animal manures
- weathering mineral soils
- rainfall and snow

Despite testimony to the contrary, the REIR continues to present salinity/carbon ratio calculations. This has been refuted and is not accepted within the Delta drinking water scientific community. The REIR acknowledges that the 1995 Twitchell Island real measured data was twice the value of the calculated ratio value. This ratio approach should be dropped from the analyses. **R2-11 cont'd**

III. SUMMARY AND INTERPRETATION OF SMARTS REPORTS (pg 4-17)

The report did not incorporate the corrections to the summary and interpretation of the SMARTS reports provided by MWQI's consultant Marvin Jung's January 2000 memo to Dr. Russ Brown of Jones and Stokes.

In addition to elevated DOC and EC, the SMARTS 1 experiments also showed that nutrients from the submerged peat soil were at eutrophic levels and resulted in algal blooms in the tanks.

R2-12

The REIR should have stated the titles, purpose, and objectives of each of the two SMARTS experiments. SMARTS 1 was titled, "A Trial Experiment On Studying Short-Term Water Quality Changes In Flooded Peat Soil Environments." SMARTS 2 was titled,"Seasonal Water Quality Changes in Flooded Peat Soil Environments Due to Peat Soil, Water Depth, and Water Exchange Rate". It is not until the end of the section (page 4-22) that the readers are informed that SMARTS was not developed to simulate the proposed operating scheme of the Delta Wetlands reservoir islands. However, the data was used extensively in the REIR to estimate organic carbon loads from the islands.

SMARTS 2 was a one-year study (1/21/99 - 1/21/00) not a 27-week study (pg 4-17). At the request of the SWRCB, DWR completed a draft work-in-progress report (dated 11/2/99) prior to the study's end. Jones & Stokes reviewed the progress report of the first 27 weeks of SMARTS 2. There were data for 36 weeks (1/21/99 - 9/15/99) in the progress report that were not used in the REIR. The additional data indicates that organic carbon buildup could appreciably continue beyond the proposed DW discharge period should restrictions be placed on those discharges.

The REIR incorrectly stated that two different peat soil sources were used (pg. 4-18). SMARTS 2 peat soil, which was delivered in two batches, were taken from the same Twitchell Island field or source. The differences between the soil character in the two batches were attributed to a major winter storm event that occurred between the time the two batches were taken. Although one soil batch was preferred, the experiment was not compromised because there were no soil differences between the tank pairs (i.e., those with same peat soil and water depths but different flow conditions (static vs. continuous flow-through) that were compared. The two soil batches divided SMARTS 2 tanks into two subexperiments with 2 pairs of tanks using batch #1 soil and the second 2 pairs of tanks the other batch.

R2-12 cont'd

The REIR compared the SMARTS peat soil water DOC to USGS field data (pg 4-19). We attribute the higher peat soil pore water DOC to be higher than field data because SMARTS simulated a waterlogged condition with no drainage occurring. Under this condition, DOC will build up in the pore water as the water to soil contact time increases. The USGS field study examined pore water DOC in a field that was drained. In this condition, surface water dilutes the pore water as it is pulled down through the peat soil. In a flooded island condition, seepage or drainage processes will be less than in a drained farm field.

The REIR also states that the USGS Twitchell Island soil water DOC were generally in the range of 40 to 100 mg/l (pg. 4-19). Table F2 from the cited 1998 USGS report showed that DOC at station "TwitPiz7" (0.5 to 1.5 ft. below land surface) was up to 207.9 mg/l on 6/20/96. The sample was taken below an enclosed pond under a reverse-flooding operation where it is flooded to about 1 feet deep from early spring to mid-July and then kept moist to very wet in standing water during the winter.

Although the SMARTS experiments were not designed specifically to simulate the Delta Wetlands reservoir islands, the results did show that peat soil characteristics and thickness, water depth, water exchange rate, duration of flooding, and time of flooding may be manageable factors that affect water quality in a wetland or reservoir island. Peat soil characteristics vary spatially and with depth at the same location depending on the history of the area. For example, heavy rains or flooding will leach away salts and organic carbon when drained. If surface water exchanges (flows) are high enough, the contribution of salts and organic carbon from the flooded peat soil is not apparent in the surface water due to high dilution and transport. Timing and duration (exposure) of flooding peat soil can also affect water quality. Long periods of

flooding will result in elevated DOC and EC in the surface water. Organic matter decay is slowest during the cold winter months when microbial activity is lowest. Therefore, collecting, storing , and releasing water during the cold months will likely result in lower concentrations than during the warmer seasons. In addition to salt and DOC concerns, there are potential eutrophication problems from nutrient releases from submerged peat soils and nuisance algal blooms. **R2-12 cont'd**

The calculated DOC load of 8 g/m2/yr was computed by Jones & Stokes and not computed in the "Candidate Delta Regions for Treatment to Reduce Organic Carbon Loads, MWQI-CR #2 (Jung and Tran, 1999)" report (pg 4-23).

IV. ESTIMATES FROM THE 1995 DEIR/EIS (pg. 4-24)

The issue that the Holland tract flooded wetland experiment may have been terminated too early to determine if the level of DOC had started to level off or not may have been addressed by the SMARTS 1 and 2 tank 1 observations. Tank 1 had 1.5 ft. of peat submerged by 2 ft. of water under static conditions. SMARTS 1 tank 1 DOC levels approached 40 mg/l at the end of 3 months. In SMARTS 2, the DOC was up to 41 mg/l in 3 months (3/31/99) and continued up to 200 mg/l by the sixth month (7/21/99) and about 250 mg/l by 9/15/99. The high TOC/DOC concentrations were attributed to the peat soil since test conditions in SMARTS 2 included covered tanks to exclude algae growth as a source. The DOC concentrations in the Holland Tract pond experiment were up to about 38 mg/l at the end of three months. **R2-13**

V. ESTIMATING EXISTING LEVELS OF DISSOLVED ORGANIC CARBON AND SALINITY IN DELTA AGRICULTURAL DRAINAGE (G-1)

Three assumptions were used in the REIR water quality assessment method. First, that EC can be modeled to be a conservative constituent on the Delta islands. Second, DOC can also be modeled to behave conservatively on the Delta islands. And thirdly, if DOC and EC or soluble salts behave similarly, the ratio of drain water EC to applied water EC can be used to predict the amount of DOC for Delta island sources.

The assumption of steady state, $C_d/C_i = D_i/D_d$, (where C is concentration of a solute, D is water depth, i is irrigation water and d is drainage water) works only if the solute in the applied-water is not sorbed by plant or soil or precipitated (Bower, 1974). For the DWEIR assumptions to be correct, if available the REIR should include supporting information to the following questions:

1. If EC is conservative, are the soluble constituents in applied water and in drainage water also conservative and shown by the same ionic ratios (composition)? **R2-14**

2. Does DOC undergo the same biological, chemical, and physical processes and reactions that occur with inorganic salts in solution?

MWQI water quality data for mineral constituents for Sacramento River water and drain water at the DW Project islands appear dissimilar. While drain water EC are often several times more than the applied water EC, not all mineral ions are in the same ratio as the drainage to applied water EC ratio. EC correlated well with some ions but not as well as with other ions (e.g., Ca, Mg, SO_4).

As the soil solution is concentrated, the salt species most likely to precipitate first are the alkaline-earth carbonates. These include CaCO3 (calcite, aragonite, or vaterite, MgCO3 (magnesite) or $MgCO_3 \cdot 3H_2O$ (nesquehonite), and (Ca,Mg) CO3 (dolomite). The amount and which form of carbonate is precipitated from the water depend upon several properties within the soil chemical system. Crops in humid climates and in irrigated areas where the applied irrigation water has a low salt concentration can absorb the sum amounts of Ca, Mg, Na, Cl, and SO4 removed annually in the same order of magnitude as that removed in drainage water.

The concentration factor that is computed by comparing drainage EC to applied-water EC is useful in predicting the concentration of nonsorbed and nonprecipitable solutes in drain water. However, the concentration factor influences precipitation, solution, cation exchange, and adsorption reactions in soil that in turn affect the quality of drainage water. As the concentration factor increases, salt precipitation and anion adsorption by soil increases, solution processes decrease and cation-exchange equilibrium shifts such that monovalent cations (e.g., Na^+) in the soil solution exchange for divalent cations (e.g. Ca^{+2}) on the exchange complex. The proportion of monovalent and divalent cations adsorbed on soil-exchange complexes are concentration dependent, with dilution favoring adsorption of cations with the highest valence (Bower, 1974). Since EC is a gross measurement of total dissolved solids, and applied and drain waters of the same EC can have different ionic composition, EC may not be exhibit full conservative behavior based on the preceding explanation and MWQI data. **R2-14 cont'd**

For example, at Bacon Island, the EC ratio was 1.96 for drainage water to applied water but not for chloride. The average chloride at Sacramento River was 6.8 mg/l (Table 4-1) with an average EC of 159 mS/cm. The comparison made in the REIR assumed the applied water was Sacramento River water with an EC of 300 mS/cm. The Bacon Island drainage chloride average was 102 mg/l. If the applied water chloride concentration followed the 1.96 EC ratio, the applied water chloride should have been 52 mg/l (102/1.96) if we assume the chloride doubled to 14 mg/l (2x6.8 mg/l) when the EC doubled to 300 mS/cm. In the Bouldin Island example, the average drain water to applied water EC ratio was 2.5 (426/160) but the corresponding average chloride concentration ratio was 4.7 (32/6.8). For Twitchell Island, the assumed EC ratio was also 3 (937/300). The applied water chloride level would have been 55 (174/3) based on the EC ratio.

The second REIR assumption is made that DOC behaves as a conservative dissolved substance (i.e., its concentration increases with evaporation, decreases with rainfall, and is not removed by biological or other physical and chemical processes) and that DOC accumulates in soil moisture in the same manner that salt does. Results from the DWR SMARTS experiments as well as by others, show that TOC and DOC is a gross measurement similar to EC and that the composition of the organic pool varies with source and time. While there are some organic fractions (e.g., humic matter) that behave conservatively because of slow degradation, organic matter in the Delta channels, islands, and drains undergo constant transformation. There were about 20 cited articles along with a lengthy discussion about the microbial degradation of organic matter in flooded peat soil in the SMARTS 2 progress report, which show that TOC/DOC are not conservative parameters. Unless there is evidence supporting the two REIR assumptions of conservative behavior in all EC and DOC measurements, the last assumption that EC can be used to model DOC cannot be made. **R2-14 cont'd**

References

Bower, C.A., 1974. Salinity of Drainage Waters. In: Drainage for Agriculture. No. 17 in Agronomy series. J. Van Schilfgaarde, ed. American Society of Agronomy, Madison, Wisconsin.

Rhoades, J.D., 1974. Drainage for Salinity Control. In: Drainage for Agriculture. No. 17 in Agronomy series. J. Van Schilfgaarde, ed. American Society of Agronomy, Madison, Wisconsin.

Division of Operations and Maintenance

I. Summary

The issues raised by the Project Operations Planning Branch have been addressed in the REIR.

II. Specific Comments

p. 3-3, a continuation of "Definition of Terms", 4th bullet of page, "South-of-Delta Delivery Deficit": The definition does not mention changes to southern SWP storage facilities such as Castaic, Pyramid, Silverwood, and Perris reservoirs. **R2-15**

p. 3-4, "DWRSIM" second paragraph, "The AFRP was implemented pursuant to the CVPIA, resulting in ... several new ... standards": The term "standards" implies regulatory obligation. No such obligation from the AFRP is beholden upon the SWP. Furthermore, the AFRP actions are only potential objectives for the operations of the CVP. **R2-16**

p. 3-13, "Delta Wetlands Project Diversion Criteria", last bullet on page, "This conidition (*X2 at Chipps Island)* was simulated in DeltaSOS with a miniumum Delta outflow requirement of 9,000 cfs for the months of September through January": The reason for using 9,000 cfs is not given. The Delta outflow requirement pursuant to Chipps Island, February through June, is 11,400 cfs. **R2-17**

p. 3-15, second paragraph, second line should read: **Delta Wetlands discharges from Bacon Island are limited to 50 percent of San Joaquin River flow, as measured at Vernalis, during the period of April through June.** Or the term "San Joaquin River inflow" could be changed to "Delta inflow from the San Joaquin River." The term San Joaquin River inflow is vague and may refer to the flow into the San Joaquin River from its tributaries. **R2-18**

OFFICE OF STATE WATER PROJECT PLANNING

WATER SUPPLY (DWRSIM)

Page 3-12

Under "Vernalis Adaptive Management Plan and Delta Export Pumping Restrictions", the statement "VAMP flow requirement depends both on San Joaquin River flows during the pulse flow period of April 15 – May 15 and the previous month's runoff condition" is not correct. It is correct that the VAMP flow requirement depends on the San Joaquin River flows during the pulse flow period, but it also depends on the current and previous year's 60-20-20 index to determine whether to do double step increases. It does not depend on the previous month's runoff conditions. **R2-19**

Page 3-17

On top of the page, the paragraph on SWP interruptible demand and delivery in DWRSIM is not correct. The interruptible demand and delivery implemented in DWRSIM are as follows:

The interruptible demand input in DWRSIM is 84 taf/month in all months, not just from November through March as stated on page 3-17. **R2-20**

Interruptible delivery is made whenever the following conditions are met:

- There is surplus water in the Delta.
- Banks P.P. has excess capacity.
- SWP San Luis storage is full (not just above target storage as stated on page 3-17).

DIVISION OF SAFETY OF DAMS

The REIR indicates that DW proposes a design for the reservoir islands that will allow storage of water up to elevation +6 feet above mean sea level. The California Water Code provides that levees in the Sacramento-San Joaquin Delta shall not be considered a dam if the maximum possible water storage elevation of the impounded water does not exceed four feet above mean sea level. (Water Code Section 6004.) Because the project proposes storage elevations above +4 feet, the levees will considered a dam. Therefore, the reservoir levees will need to be designed pursuant to requirements of the Division of Safety of Dams for "jurisdictional" dams. R2-21

Projects for jurisdictional dams must submit a construction application to DSOD after obtaining its water rights. All dam safety issues related to the proposed work would have to be resolved prior to approval of the application and any construction activity.

ENVIRONMENTAL SERVICES OFFICE

Environmental Services Office staff reviewed the May 2000 Delta Wetlands Project REIR. Our review focused on whether the REIR addresses our earlier comments on the previous DEIR. Overall, we noted several improvements over the DEIR, but several major issues remain unresolved. Our major concern continues to be that: 1) there is inadequate information about the project's fish facilities; and 2) the document does not adequately address the potential predation impacts of project facilities. Specific comments are summarized below.

I. FISH SCREEN AND PREDATION ISSUES

The REIR does not adequately address the Department's previous comments on the draft document regarding fish facilities. The revised document provides some additional information about the project's fish screens, namely that they will comply with the Reasonable and Prudent Measures of the regulatory agencies regarding fish protection, DFG's fish screening policy (the document is silent regarding compliance with NMFS's fish screening criteria), and the USFWS 0.2 foot per second approach velocity criterion for delta smelt. R2-22

While generally this additional information is helpful, the revised document does not provide the information on predation, hydraulic control, debris, cleaning systems, and other maintenance issues that DWR suggested in December 1995. In the discussion on pages 5-16 and 5-17, the document fails to mention the predation that is likely to occur at fish screens. The document also appears to inaccurately attribute to the NMFS Biological Opinion the statement that fish screens will *reduce* predation during diversion operations (a statement that is contradicted by the DFG Biological Opinion), and fails to state to what this reduction is compared. The document is also

unclear as to the exact number of project intakes. We continue to be concerned that project facilities including screens and boat docks will increase the number of feeding stations for predators. We disagree with the assertion in the EIR/EIS (Page 5-16) that project facilities will not significantly affect predator-prey interactions. We are concerned that the proposed DW instream structures will increase the number of feeding stations for predators. The problem would be exacerbated during periods when DW is diverting, creating higher concentrations of prey (and increased predation rates) in channels adjacent to the DW project through a "bathtub drain" effect. In summary, most of DWR's previous comments about fish screens and predation were not addressed . **R2-22 cont'd**

II. THE PROPOSED ADAPTIVE MANAGEMENT STRATEGY FOR FISH

The Final Operations Criteria (Appendix B) in the REIR still provides insufficient information about who will collect the required data and whether the information can be processed quickly enough to allow adaptive management. We continue to have questions about whether the proposed use of transport modeling will be: 1) performed quickly enough to allow for adaptive management within a reasonable time frame; and 2) relevant to all of the fish species of concern. **R2-23**

III. OTHER ISSUES

Several other points raised by DWR regarding the previous DEIR do not appear to have been addressed. The REIR still does not provide an adequate analysis of the potential for nuisance algal blooms, has not updated key biological information (e.g. splittail life history) and provides few details about the methodologies used for impact analysis. **R2-24**

DIVISION OF ENGINEERING

The Division of Engineering reviewed the Delta Wetlands Project REIR, including the Appendix H, "Levee Stability and Seepage Analysis Report for the Delta Wetlands Project."

A. Liquefaction

The liquefaction evaluation presented in the REIR indicates that *"a few pockets of potentially liquefiable soil deposit may exist in the levees and foundation soils. We believe, however, that these liquefiable soil pockets are confined in limited areas and therefore are expected to have negligible adverse effects on the stability of the levees."* This evaluation is not consistent with the Corps of Engineering's 1987 study, "Sacramento – San Joaquin Delta Levees Liquefaction Potential," or Division of Engineering's review of DWR geological investigations for Webb Tract and Bacon Island. The Corps of Engineers study identified Webb Tract as having *high* liquefaction **R2-25**

potential (defined as 50 percent of the borings analyzed indicate liquefiable soils for a 5.5 M earthquake and ground motion of 0.10g). Bacon Island was identified as having *moderate* liquefaction potential (defined as 21 to 50 percent of the borings analyzed indicated liquefiable soils under the same earthquake loading conditions). Boring logs from DWR geotechnical investigations indicate areas of loose sand (Standard Penetration Test blow counts less than 10) in both the embankment and the foundation.

It should be noted that the Corps of Engineers 1987 report identified both Webb Tract and Bacon Island as islands which had undergone prior earthquake damage. A 250-foot slip reportedly occurred on the east levee of Bacon Island following the M5.5 Livermore earthquake of January 24, 1980. Levee cracking was reported on Webb Tract after the 1983 Pittsburg and Coalinga earthquakes. **R2-25 cont'd**

The liquefaction of the embankment and foundation should be further evaluated. Liquefaction mitigation, if required, could significantly impact project costs.

B. Design Earthquake Loading

The design earthquake loading reflects 10 percent accedence in 50 years. This loading represents the minimum ground motion identified by the Uniform Building Code for normal (non-critical) structures. This level of earthquake loading is less than what would be required for jurisdictional dams, critical structures (i.e. Hospitals, etc.), and most landfills, and it may be unconservative in light of potential economic and water quality impacts. **R2-26**

C. Slope Stability

Large displacements were predicted for the landside slopes (2 feet) and waterside slopes (4 feet) for the four sections analyzed. It should be noted that the sections chosen do not reflect the most critical sections analyzed in terms of slope stability. Consequently, the results presented do not reflect the largest values of anticipated displacement that could occur. **R2-27**

The large displacements predicted for the levees under seismic loading would result in severe cracking and possible failure from erosion or overtopping. Consequently, the proposed levee freeboard (3 feet) may need to be increased to help prevent an overtopping failure.

California Department of Water Resources

R2-1. The NEPA and CEQA analysis for the Delta Wetlands Project analyzes a reasonable range of alternatives that would meet the project purpose; it also analyzes the No-Project Alternative as required by NEPA and CEQA. As described in Chapter 2 under "Alternatives Considered but Not Selected for Detailed Evaluation", the lead agencies considered water storage on other Delta islands as a potential alternative. Lower Jones Tract, Upper Jones Tract, McDonald Island, Victoria Island, and Woodward Island were all considered in the evaluation of other Delta islands. However, those sites were eliminated from further evaluation because other factors, such as conflicts with existing infrastructure, made them impracticable as alternative storage sites. See the Section 404(b)(1) Alternatives Analysis presented in Appendix 4 of the 1995 DEIR/EIS for more details.

R2-2. The commenter recommends building the Delta Wetlands Project in stages, with one reservoir island and one habitat island created and operated in each stage. The comment suggests that by monitoring the quality of reservoir water during the first stage, Delta Wetlands will be able to determine, before it operates the full-scale project, the water quality effects that are likely to result from project operations and the extent of mitigation that would be necessary. The commenter suggests that such a staged approach would reduce the risk that Delta Wetlands would have to mitigate large effects of discharges on water quality after it had filled both reservoirs.

As noted in the paragraph that precedes this comment, however, the quality of water stored over peat soil may vary considerably and may be influenced by several factors, such as the time of flooding, duration of storage, depth of stored water, and site-specific peat soil characteristics. The FOC include different discharge rules for the two reservoir islands (i.e., discharges are allowed from Bacon Island in any month but are allowed from Webb Tract only from July through December); therefore, the diversion and discharge cycles on these two islands would differ, and the water quality parameters for the water stored on each island may differ somewhat. For this reason, the data collected for one island would help determine what timing and rate of discharges from that island would be appropriate to avoid potential water quality effects, but they would not necessarily replicate the conditions that would be found on the second island. Therefore, the two islands will need to be monitored separately.

The 1995 DEIR/EIS and the 2000 REIR/EIS evaluated the construction and operation of the four proposed project islands as one project. The proposed mitigation of the potential effects of discharging water with elevated EC or DOC levels is to do the following:

monitor water quality parameters and

control the release of water for export or augmentation of outflow as necessary to maintain those parameters at or below specified levels in the blended water at the export facilities or in outflow.

It is not necessary to construct and operate a staged project rather than the full-scale project to directly mitigate environmental impacts of the proposed project; such staged construction and operation would be at the discretion of the project applicant.

R2-3. This commenter suggests that the significance criterion of a 20% change in the monthly average export DOC concentration used in the 2000 REIR/EIS is too lenient.

The first part of this comment states that the significance criterion for DOC of a 20% increase in average concentration (0.8 mg/l) is equivalent to half the existing contribution of all Delta agricultural drainage to the export DOC concentration. This conclusion appears to be based on a misunderstanding of some statements in the 2000 REIR/EIS. Contrary to what the commenter states, the text of the 2000 REIR/EIS does not indicate that 40% of export DOC originates from agricultural drainage; it states that "40% of total Delta agricultural drainage is assumed to originate from the Delta lowlands and be transported toward the export pumps" (page G-13 of Appendix G). The monthly average concentration of DOC at the export pumps depends on several factors:

- DOC concentrations in water that comes into the Delta,
- the way in which in-Delta activities (including agricultural activities) change DOC concentrations,
- the volume of Delta inflows and exports, and
- the proportion of the export water that comes from each source.

Appendix G indicates that the Delta lowlands are assumed to be the source area for all DOC increases in the Delta, and that drainage from the lowlands is assumed to be about 40% of the total flow from agricultural drainage in the Delta. Because flow from agricultural drainage is only a portion of the total export water, Delta agricultural drainage would contribute only a fraction of the export DOC concentration; the fraction from agricultural drainage varies throughout the year depending on agricultural drainage activities.

The commenter also reports that DWR and others are working to identify options for reducing organic carbon loads by controlling Delta island drainage and using other techniques, such as treatment. The comment discusses costs for reducing organic carbon at treatment facilities by 0.8 mg/l. It is unclear what averaging period is used in the commenter's estimates of treatment costs; however, the values appear to be annual costs.

The significance criterion used in the analysis of Delta Wetlands Project effects on water is applied to changes in export DOC on an average monthly basis. The project could adversely affect DOC concentrations at the export pumps only during those months when discharges are occurring, typically 1–3 months in a year. As reported in the results of the 72-year simulation, Delta Wetlands would not exceed the significance criterion during

every discharge month. Additionally, Delta Wetlands operations would improve DOC conditions compared to existing (no-project) conditions during other months when agricultural drainage from the project islands would have increased DOC under no-project conditions. Therefore, the net annual effect of the Delta Wetlands Project on export DOC would be much less than the monthly changes reported in the document. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for a discussion of project effects on DOC and treatment plant costs.

The Delta Wetlands Project WQMP requires monitoring of project-related TOC loading that could cause an increase in water treatment costs. Master Response 7 describes the WQMP screening criteria that would trigger the requirement that Delta Wetlands modify operations (e.g., reduce or reschedule discharges) and implement mitigation of long-term water quality impacts.

R2-4. As stated by the commenter, CALFED has established an overall long-term goal to reduce TOC at the exports to less than 3 mg/l. This is a very ambitious goal. DWR monitoring data indicate that concentrations of export TOC exceed 3 mg/l more often than not under existing conditions (see Figure G-9 in Appendix G of the 2000 REIR/EIS and Appendix C1 in the 1995 DEIR/EIS). For purposes of the Delta Wetlands modeling analysis, average DOC concentrations in the Sacramento River and San Joaquin River were assumed to be 2 mg/l and 4 mg/l, respectively, and the simulated annual average DOC concentration in exports was approximately 4 mg/l (see Chapter 3C of Volume 1 of this FEIS). Therefore, an isolated Delta facility that diverts water from the Sacramento River directly to the export locations would be the best option for satisfying the target of 3 mg/l.

The lead agencies recognize the goals of other agencies, including CALFED, to improve water quality conditions. However, the analysis of a project's effects in compliance with CEQA and NEPA compares existing (no-project) conditions and with-project conditions to determine the incremental effect of project operations. CALFED's long-term goal does not reflect existing conditions and is not a prevailing standard. The analysis of Delta Wetlands Project effects on DOC appropriately uses significance criteria that are based on existing conditions, rather than on CALFED's goal. In addition, even if water diverted and discharged by Delta Wetlands had higher DOC concentrations than were considered acceptable for exporting, reservoir island storage and discharges could still supply Delta outflow during periods with reduced Delta inflows at times when the CVP and SWP are not exporting water.

One of the Delta Wetlands WQMP "Drinking Water Quality Protection Principles" states that "Project operations shall contribute to CALFED's progress toward achieving continuous improvement of Delta drinking water source quality". In agreeing to implement the WQMP, Delta Wetlands has committed to operating according to this principle.

R2-5. Under the proposed project, Delta Wetlands would divert water onto the habitat islands to provide the water necessary for implementing the HMP. Diversions and discharges of water to and from the habitat islands would not differ substantially from existing

agricultural practices. Because a large portion of the habitat islands would remain in agricultural crops, it is assumed that the DOC concentrations of habitat island discharges would be similar to those of current agricultural drainage. Discharge from the habitat islands would account for a very small proportion of water exported from the Delta; therefore, if DOC loading on the habitat islands were found to be greater than under existing agricultural practices, the resulting effect on export DOC concentration would be extremely small.

Additionally, the Delta Wetlands WQMP requires Delta Wetlands to monitor water quality conditions on the habitat islands. Under the WQMP, the operational screening criteria apply to the effects of project operations taking place on both the reservoir islands and the habitat islands. The TOC screening criteria are described in Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

R2-6. DWR indicates that wastewater discharges may increase in the future, and potentially contribute a larger amount of DOC to exports under cumulative future conditions. The discussion of cumulative future impacts did not include changes in the DOC concentrations of inflows from the Sacramento and San Joaquin Rivers because it is difficult to quantify the influence that wastewater treatment plant projects would have on future DOC levels. An increased load of DOC from wastewater would probably increase the background DOC at the export locations. In general, this could limit future Delta Wetlands Project operations.

R2-7. The commenter indicates that the significance threshold used in the 2000 REIR/EIS allows the Delta Wetlands Project to increase the DOC load in exports by 20%. This is incorrect. The 20% significance criterion would allow an increase in the *monthly* DOC concentration equal to 20% of the mean DOC concentration; the mean DOC concentration in exported water is estimated to be 4 mg/l. As described in response to Comment R2-3, the net annual effect of the Delta Wetlands Project on export DOC would be much less than individual monthly changes reported in the document. Additionally, the Delta Wetlands WQMP includes more detailed operating criteria for project diversions and discharges related to effects on TOC. See also Master Response 6, "Significance Criteria Used for the Water Quality Impact Analysis".

R2-8. The units used in the 2000 REIR/EIS are scientifically consistent and accurate. Loads are basically a mass of material in some volume or from some area in some time period; there are many different possible units for measuring loads. All experimental and field measurements of DOC concentrations are normalized to the common units of g/m^2 in the analysis so that the different measurements can be compared. Methods for converting concentration measurements to estimates of DOC loading are described in the 2000 REIR/EIS on pages 4-15, 4-18, and 4-23 (pages 3C-54, 3C-56, and 3C-61, respectively, of Volume 1 of this FEIS), given in the footnotes of Table 4-5 (Table 3C-13 in FEIS Volume 1), and detailed in many of the sections of Appendix G.

R2-9. DWR suggests a methodology for estimating the effects of Delta Wetlands operations on export DOC loads that is similar to the methodology built into the DeltaSOQ model used in the 2000 REIR/EIS. By comparing with-project conditions to no-project conditions, both methods isolate the effects attributable to changes in DOC from the project islands; however, the methods differ with DWR's step 4. DWR recommends calculating the load, in weight, of DOC contributions from the Delta Wetlands islands to exports under both no-project conditions and with-project conditions. These two values would be compared; a significant impact would be identified when the DOC load from the project islands under project operations exceeds a given percentage of the load from the same islands under no-project conditions.

This alternative method for determining project impacts, however, does not address the underlying reasons for controlling DOC levels. DOC loads, in themselves, do not constitute an environmental concern; DOC in raw water is of concern only because the water may be treated for use as drinking water, possibly resulting in the formation of DBPs, which may affect human health. The criteria for treating water delivered to treatment plants are expressed as concentrations of DOC. Therefore, the change in DOC concentration (not DOC load) at the export locations is the most appropriate water quality assessment variable.

See response to Comment R2-4 regarding CALFED targets for long-term DOC concentrations.

R2-10. For purposes of impact assessment, an annual average concentration of DOC was used to establish the significance criteria. During project operations, the impact of Delta Wetlands diversions and discharges would be a function of the concentration of DOC in Delta Wetlands' water, in Delta inflows, and at the export pumps. Seasonal changes in DOC concentrations could be monitored, and the criteria used to trigger mitigation could be based on a different (i.e., seasonal) averaging period. However, the incremental effect of the Delta Wetlands Project would still drive the evaluation of project impacts on export DOC and the need for mitigation. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", regarding the mitigation triggers proposed in the Delta Wetlands Project WQMP. The full text of the WQMP is included in the Delta Wetlands–CUWA agreement in the Appendix to the Responses to Comments.

R2-11. See response to Comment B7-8.

R2-12. **Summary of Use of the SMARTS Data in the NEPA and CEQA Analysis.** The SMARTS experiments, like all the information on DOC loading and concentrations presented in the 1995 DEIR/EIS and in testimony presented in the water right hearing, were interpreted and evaluated for applicability to conditions under the proposed project. Results of the SMARTS experiments were considered in combination with all the other available information on DOC.

Of the available sources of information on DOC, however, the SMARTS reports include some of the information most relevant to project conditions (because it pertains to releases of DOC from Delta-island peat soils). Therefore, special attention was given in Chapter 4 of the 2000 REIR/EIS to describing the SMARTS experiments and interpreting their results (see Chapter 3C of Volume 1 of this FEIS). This necessarily involved evaluating the limitations of comparing the conditions induced in the laboratory with natural processes on the project islands. The 2000 REIR/EIS therefore included several interpretations and evaluations of the SMARTS data that went beyond the information provided by DWR. DWR, for example, did not calculate DOC loads from the tanks and did not compare the concentrations of DOC or EC in soil water with those measured in the water.

Evaluation of the 36-Week Data Set Provided by DWR. The latter 9 weeks of data in the 36-week data set were overlooked during the preparation of the 2000 REIR/EIS evaluation because they were not included in the data sheets in DWR's progress report (although they were graphed in another part of the report). Review of these additional data indicates that the DOC concentration increased most rapidly during the first 6 months of the experiment.

Measurements of pore-water DOC concentrations provide additional information about the rate at which DOC is released over time. The peat soil in the SMARTS tanks is assumed to consist of about 50% pore water and 50% peat soil particles. The pore-water DOC concentration increases as the peat soil particles are modified by microbial (biochemical) processes and pieces of the complex organic molecules dissolve into the pore water. The pore water then mixes with the surface water in the tank and DOC is transferred from the pore water to the surface water. The measured DOC load in the SMARTS tanks is the combination of the initial source of DOC in the pore water and the relatively slow exchange with the surface water.

The DOC loading observed in the tanks is the result of DOC loading from the pore water and will be greater if the pore-water DOC concentration is higher. Review of the data showed that the pore-water DOC concentrations in the SMARTS 2 static tanks increased dramatically during the initial 4 months of the experiment, then decreased during the subsequent months of the experiment; this result indicates that the subsequent production of DOC from the submerged peat soil was limited. The origin of the high DOC concentrations during the initial months cannot be identified; DWR did not make detailed biochemical measurements of the peat soils.

Difference in Soil Batches Used by DWR. The SMARTS 2 data showed different DOC and EC values in the soil water from the two batches of soil collected from the same field on Twitchell Island. DWR attributes the differences to the effects of leaching by rainfall. However, there were only about 4 inches of rainfall in November 1999. Because the soil water for the 12-inch soil layer scraped for use in the SMARTS tanks would be about 6 inches, almost all of the rainwater should have been retained in the soil. It is unlikely that salt or DOC would already have been leached from the soil.

The discussion on page 4-18 of the 2000 REIR/EIS (page 3C-57 of FEIS Volume 1) notes the differences in EC between the two batches to indicate the different initial characteristics of the soils. It is important to note such information when interpreting experimental results because the information helps to define the limits of applicability of the data.

USGS Field Data. One USGS measurement of 208 mg/l in soil water on Twitchell Island does not invalidate the statement in the 2000 REIR/EIS that most DOC concentrations in soil water from the Delta are less than 100 mg/l. The values for the soil used for SMARTS 2 were very high in comparison.

Summary Conclusions. As noted in the comment, the DWR SMARTS experiments were successful in obtaining measurements of DOC concentrations related to flooded peat soils. The results must be interpreted before the raw data can be applied to scientific purposes such as impact evaluations.

See responses to Comments B7-50 and C14-13 regarding algae and nutrients in Delta Wetlands water.

R2-13. The results of the SMARTS studies and the results of the Holland Tract demonstration wetland experiment were both used in estimating the potential for DOC loading on the reservoir and habitat islands. The Holland Tract experiments, although limited in scope and duration, best mimic the in-field conditions that may be found during project operations.

The commenter is comparing DOC concentrations in surface water from the SMARTS experiments to DOC concentrations from the Holland Tract experiment; however, DOC concentrations alone do not provide an adequate estimate of potential loading. The depth of water over the peat soil contributes to the final DOC concentrations. It may be more appropriate to compare the DOC in soil water from the SMARTS studies with that found in the Holland Tract experiment; see response to Comment R2-12 for more information about the uses of data on soil pore-water. It is agreed that measurements will be needed to determine the actual values for DOC loading from Bacon Island and Webb Tract. The Delta Wetlands Project WQMP includes monitoring to obtain such measurements; the full text of the WQMP is included in the Delta Wetlands–CUWA agreement in the Appendix to the Responses to Comments.

R2-14. The chemical reactions and processes within the peat soils in the Delta are numerous and complex. Appendix C-2 in the 1995 DEIR/EIS includes a full discussion of the anion and cation ratios in water from the Sacramento River, the San Joaquin River, and the ocean. The assumption that all diverted salt and DOC is later incorporated in the drainage water is appropriate for the simulated monthly assessment of potential impacts used for CEQA/NEPA impact assessment. See also response to Comment B7-8.

The commenter also states that the EC and chloride ratios used in this method are not always consistent; the EC ratio on Bacon Island is used as an example. The commenter

fails to note, however, that some of the chloride in the water diverted onto each of the Delta Wetlands islands originated from San Joaquin River water or from the intrusion of seawater into the Delta. The ratio of chloride to EC is higher for these water sources. For more information, see Appendix G of the 2000 REIR/EIS and Appendix C2 of the 1995 DEIR/EIS.

The commenter points out that the simple method of estimating the DOC load in agricultural drainage that is described in the 2000 REIR/EIS is a very rough approximation. This method provides only a rough approximation of the DOC that could have originated from the applied irrigation and seepage water. However, this is an adequate method to use in establishing baseline conditions for a monthly simulation of potential project effects.

R2-15. Operations of southern SWP reservoirs are generally simulated by DWRSIM to follow fixed monthly storage changes. Possible changes in southern reservoirs were not included in the estimates of deliveries or delivery deficits.

R2-16. The commenter is correct. AFRP target actions are applied only to CVP facilities under the CVPIA and court interpretation of the CVPIA. DWR is not directly obligated to change SWP operations to meet AFRP target actions. However, actions that apply to CVP facilities may also affect SWP operations because of the Delta outflow requirements and export pumping limits, such as the WQCP E/I ratios and the Vernalis Adaptive Management Plan (VAMP) pumping limits, that the SWP and CVP share under complex rules and procedures.

R2-17. The Chipps Island X2 requirement described on page 3-13 of the 2000 REIR/EIS (page 3A-34 of Chapter 3A of FEIS Volume 1) applies only to diversions under the Delta Wetlands Project. Maintaining X2 at or below Chipps Island requires an outflow of approximately 11,400 cfs. The minimum *monthly* flow of 9,000 cfs was used in the monthly modeling to represent the average of the two X2 requirements that apply to the Delta Wetlands Project: 10 days of outflow at 11,400 cfs to maintain X2 at Chipps Island and approximately 20 days of outflow at 7,100 cfs to maintain X2 at Collinsville. These values result in a monthly average of 8,533 cfs; therefore, monthly project simulations use a 9,000-cfs minimum monthly outflow for Delta Wetlands diversions in September through January to approximate these requirements.

The Delta outflow requirement referenced by the commenter (11,400 cfs) is part of the 1995 WQCP and is applied to the SWP and CVP operations based on Delta conditions. The Delta Wetlands X2 requirement described above is independent of the CVP and SWP requirement. Maintenance of the 1995 WQCP outflow requirement is simulated in DWRSIM. The assessment in the 2000 REIR/EIS does not adjust DWRSIM estimates of required Delta outflow.

R2-18. The term “San Joaquin River inflow” referenced by the commenter refers to flow at Vernalis.

R2-19. The text referred to by the commenter has been revised as follows:

> The VAMP flow requirement depends both on San Joaquin River flows during the pulse-flow period of April–May 15 and ~~on the previous month's runoff conditions~~ the current and previous water-year 60-20-20 index values . . .

R2-20. The text referred to by the commenter has been revised as follows:

> This assumption of maximum possible export pumping is similar to the SWP interruptible supply simulated in DWRSIM 771 as 84 TAF/month (i.e., 1,400 cfs) ~~during the November-through-March period, whenever there is available water for SWP export beyond the specified monthly demands and SWP target storage in San Luis Reservoir~~; interruptible delivery is made when the following conditions are met:
>
> # there is surplus water in the Delta,
> # Banks Pumping Plant has excess capacity, and
> # San Luis Reservoir is full.

Because DWRSIM assumes that contractors will take this additional water whenever it is available during winter, it may be reasonably assumed that the Delta Wetlands Project water would be purchased when available.

R2-21. See response to Comment B7-6.

R2-22. Responses to comments on the 1995 DEIR/EIS submitted by DWR's Environmental Services Office are provided in Chapter 3 (see responses to Comments B7-62 through B7-83).

The commenter states that the 2000 REIR/EIS "provides some additional information about the project's fish screens, namely that they will comply with the Reasonable and Prudent Measures of the regulatory agencies regarding fish protection, DFG's fish screening policy (the document is silent regarding compliance with NMFS's fish screening criteria), and the USFWS 0.2 foot per second approach velocity criterion for delta smelt". The commenter further states that the document does not provide the information on predation, hydraulic control, debris, cleaning systems, and other maintenance issues that DWR commented on in December 1995, and requests information on these issues.

The basic fish screen design proposed by Delta Wetlands was described in Appendix 2 of the 1995 DEIR/EIS. DFG, NMFS, and USFWS subsequently considered fish screen design and operation criteria in the federal and California ESA consultation. All the requirements of these agencies for Delta Wetlands' fish screen design and procedures are specified in their biological opinions for the project, which are included in Appendices C, D, and E of the 2000 REIR/EIS. See also response to Comment B6-60.

Chapter 5 of the 2000 REIR/EIS (see Chapter 3F of Volume 1 of this FEIS) provides *summary* information about DFG's, NMFS's, and USFWS's fish screen measures that have been incorporated into the proposed project. It refers to the measures included in the FOC (the 0.2-fps approach-velocity criterion) and in the DFG and NMFS biological opinions, and refers reviewers to the appropriate appendices of the 2000 REIR/EIS for details. See response to Comment B6-60 regarding the details of the fish screen design that were developed through consultation with DFG, NMFS, and USFWS.

For a discussion of the potential for predation at the Delta Wetlands facilities, see response to Comment B7-64.

In reference to predation, this comment also states that the document "appears to inaccurately attribute to the NMFS Biological Opinion the statement that fish screens will *reduce* predation during diversion operations ... and fails to state to what this reduction is compared". The commenter is apparently referring to the summary of NMFS biological opinion RPMs listed on page 5-6 of the 2000 REIR/EIS (page 3F-48 of Chapter 3F of FEIS Volume 1).

NMFS's RPM on fish screens states: "Measures shall be taken to reduce the extent of entrainment and predation during Delta Wetlands diversion operations through the use of properly designed fish screens". Details about this measure are provided on pages 40 and 41 of the biological opinion (Appendix D of the 2000 REIR/EIS). The summary statement on page 5-6 of the 2000 REIR/EIS (FEIS Volume 1, page 3F-48) characterizes this RPM accurately; it indicates that NMFS requires Delta Wetlands to use properly designed fish screens to reduce entrainment and predation during diversion operations. The reduction is in comparison with existing conditions; this does not contradict the DFG biological opinion. Constructing fish screens that meet the terms and conditions in the biological opinions would result in less entrainment and less predation than diverting water without fish screens or using an inferior fish screen design.

The commenter's discussion also refers to a "bathtub drain" effect that could occur during project diversions. Available information, including documents produced by DWR, does not conclusively support the assumption that diversions, such as those proposed by Delta Wetlands, would result in a "bathtub drain" effect. Because of the low approach velocity (0.2 fps) at the screen face of Delta Wetlands' siphons and the bypass flow that would be provided by tidal and net Delta channel flow, it is unlikely that the fish screens and diversion facilities would cause concentration of juvenile salmonids and other fish species. DWR has not provided information supporting a "bathtub drain" effect related to the CVP and SWP exports from the south Delta. A bathtub drain effect, therefore, would not be expected during operation of the Delta Wetlands Project, especially given the FOC restrictions that limit Delta Wetlands' diversions to a percentage of outflow and San Joaquin River inflow. Because of these limitations, Delta Wetlands would have much smaller potential effects on channel flows than would CVP and SWP exports.

R2-23. Transport modeling was proposed in the 1995 DEIR/EIS as part of the mitigation of potential effects of the Delta Wetlands Project on fisheries. The mitigation measures proposed to reduce project effects on fishery resources have been replaced with the FOC and RPMs described in the biological opinions, as discussed in Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions". The FOC terms do not include transport modeling but include a monitoring program that is summarized in Master Response 4; the program includes, but is not limited to, in-channel and on-island monitoring, reporting, and resolution of technical monitoring issues with DFG. For more detail, see the attachment to the FOC entitled "Delta Wetlands Fish Monitoring Program" in Appendix B of the 2000 REIR/EIS.

R2-24. See response to Comment B7-50 regarding mitigation of algae blooms. See responses to Comments B7-66 and B7-74 regarding the commenter's previous request for more information about the life histories of delta smelt and splittail. It is not clear which methodologies the commenter is referring to; see responses to Comments B7-67 and B7-79 through B7-83.

R2-25. Although the potential for liquefaction is understated in the Appendix H text referenced by the commenter, the analysis of dynamic levee stability accurately reflects a high potential for liquefaction in the soils analyzed. The review of the borings drilled in the proposed reservoir islands indicates that the upper 5–10 feet of the shallow sand alluvium are loose and saturated; therefore, the potential for liquefaction is high. Should a severe earthquake occur in the region, liquefaction-induced damage to the Delta levees could be substantial under both the no-project and with-project conditions. The post-liquefaction residual strength in the upper sand alluvium was incorporated into the dynamic levee stability model (see Appendix H of the 2000 REIR/EIS). A soft/loose foundation layer under the levees was used in the model to represent both the peat and the loose sands that are subject to liquefaction. The deeper portion of the sand alluvium is described as dense to very dense, and hence not susceptible to liquefaction. These foundation conditions are the same under the baseline (no project) and proposed project. No additional analysis or mitigation is required.

R2-26. The design earthquake used in the seismic evaluation of the reservoir levees is appropriate for the NEPA and CEQA analysis. The ground motions at the project site for the earthquake event with a 10% probability of exceedance in 50 years is also the maximum credible earthquake on the Midland Thrust fault, which is the controlling fault for the project islands. The ground motions used for the project are similar to the ground motions considered in the evaluation of the seismic vulnerability of the Delta levees conducted by the CALFED Levees and Channels Technical Team, Seismic Vulnerability Sub-Team (CALFED Bay-Delta Program 1999b).

R2-27. The cross sections used for the analysis of static slope stability and earthquake-induced levee deformation were selected to be reasonably representative of conditions that would be encountered on the reservoir islands and to allow for conservative estimates for stability issues. Therefore, the results of the analysis are representative of stability conditions in

most parts of the Delta Wetlands Project levees, but not of worst-case conditions. See Master Response 8, "Levee Stability Analysis and Worst-Case Conditions".

The analysis of earthquake-induced levee deformation is based on state-of-the-practice procedure and consists of using the following:

limit-equilibrium slope stability analysis, to estimate the most critical failure surface and associated yield acceleration; and

the Newmark double integration method, used in conjunction with the acceleration time histories. This method is used to estimate the deformation that would be associated with the most critical failure surface of the section analyzed.

Several figures in Section 3 of Appendix H of the 2000 REIR/EIS show the most critical failure surfaces determined through the evaluation; the results indicate that such deformation would affect only a portion of the crest. Therefore, the proposed levee freeboard would be adequate to prevent an overtopping failure under seismic conditions. Additionally, the measures proposed to mitigate inadequate channel-side stability would also apply to slough-side deformation, and would apply to more severe conditions as well as the conditions analyzed.

California Regional Water Quality Control Board

Central Valley Region

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20 July 2000

Aimee Dour-Smith
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CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) DOCUMENT REVIEW FOR PROPOSED PROJECT: DELTA WETLANDS PROJECT, CONTRA COSTA AND SAN JOAQUIN COUNTIES

We have reviewed the draft EIR CEQA Document.

To protect water quality, the Regional Water Quality Control Board will require appropriate pollution control measures during construction and post construction. The Regional Board may require the following: Construction Storm Water Permit, 401 Water Quality Certification, General Order for Low Threat and Dewatering General Order.

Construction Storm Water Permit
A Construction Storm Water Permit (Order No. 99-08-DWQ) is required for construction activities where clearing, grading, filling, and excavation result in a land disturbance of five or more acres. The Storm Water Permit requires that discharges of sediment and earthen materials, as well as chemicals and other materials from vehicles, building materials, and storage areas be eliminated or minimized. The permit also requires a Storm Water Pollution Prevention Plan be prepared which specifies: 1) Best Management Practices preventing construction pollutants from contacting with surface waters and 2) a monitoring program for the site. If there are any questions about the Storm Water program, you may call Dani Berchtold at (916) 255-3383 or Leo Sarmiento at (916) 255-3049. R3-1

401 Water Quality Certification
A Federal 404 permit is required for activities involving a discharge (such as dredged material or fill) to waters of the United States. "Waters" include wetlands, riparian zones, streambeds, rivers, lakes, and oceans. These projects also require a Water Quality Certification (per Section 401 of the Clean Water Act) verifying the project does not violate State water quality standards. If there are any questions about the Water Quality program please contact Matthew Reischman at (916) 255-3120.

Dewatering Permit
Some pollutants associated with construction dewatering activities may be addressed under the General Construction Storm Water Permit. However the Central Valley Regional Board may choose to cover the dewatering discharge under Order No.5-00-175, General Order for Dewatering and Other Low Threat Discharges. For Dewatering Permit questions, please contact Leo Sarmiento, of our Stormwater Unit at (916) 255-3049 or Patricia Leary, of our NPDES Section at (916) 255-3023.

Aletheia G.
Aletheia Gooden
Program Assistant

California Regional Water Quality Control Board, Central Valley Region

R3-1. Delta Wetlands applied to the SWRCB for a water quality certification under Section 401 of the Clean Water Act. As stated in the 2000 REIR/EIS, the SWRCB denied the Section 401 certification without prejudice in 1998. Delta Wetlands will resubmit the application for Section 401 certification to the SWRCB. Table 4-1, "Permits and Approvals that May Be Required for the Delta Wetlands Project Alternatives", of the 1995 DEIR/EIS and of Volume 1 of this FEIS includes water quality certification under Section 401 from the SWRCB and the issuance of waste discharge requirements by the regional water quality control board (RWQCB). The following additional information has been added to Table 4-1:

Agency and Requirements	Agency Authority	Project Activities Subject to Requirements
Regional Water Quality Control Board		
Construction Storm Water Permit (Order No. 99-08-DWQ)	The RWQCB, under the SWRCB, ensures compliance with National Pollutant Discharge Elimination System requirements pursuant to Section 402 of the Clean Water Act	Clearing, grading, filling, and excavation activities extending over 5 acres or more

CALIFORNIA **URBAN WATER** AGENCIES

July 31, 2000

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State Water Resources Control Board
Division of Water Rights
Attn: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers, Sacramento District
Regulatory Branch
Attn: Mike Finan
1325 J Street, Room 1480
Sacramento, CA 95814-2922

Delta Wetlands Project
Draft Revised Environmental Impact Report/Environmental Impact Statement

Dear Mssrs. Sutton and Finan:

California Urban Water Agencies[1] (CUWA) has reviewed the Delta Wetlands Project Draft Revised Environmental Impact Report/Environmental Impact Statement (DREIR/S) and respectfully submits the following comments for your consideration.

Background

California Urban Water Agencies (CUWA) and its member agencies have been participating in the public review of this Project since 1997 and are parties to the water rights proceedings for the Project. The primary focus of CUWA's participation in the review of the Project has been to ensure that the potential impacts to drinking water quality due to Project operations are adequately mitigated. CUWA is concerned that, left unmitigated, the Project could lead to long-term degradation in drinking water quality. There is a potential for Delta Wetlands operations to result in increased total organic carbon (TOC), bromide, total dissolved solids (TDS) and chloride concentrations in urban water supplies. In addition, the Project has the potential to adversely impact human health and increase the cost of water utility operations. These potential impacts are ascribed to the Delta Wetlands Project because of the high rates of discharge of water with elevated concentrations of constituents of concern in close proximity to urban water agencies' intakes. **R4-1**

[1] The California Urban Water Agencies (CUWA) is an organization of twelve municipal water providers serving over 22 million water consumers in the City of Sacramento, San Francisco Bay Area and Southern California. CUWA's member agencies use about 90% of the urban water supplies diverted from the Sacramento-San Joaquin Delta and its tributaries.

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In an effort to address these concerns, CUWA and Delta Wetlands are developing a water quality management plan (WQMP) for the Project. Similar to the mitigation plan provided in the DREIR/S, the draft WQMP provides that the Delta Wetlands operations would be regulated based on information from real-time monitoring and modeling of actual daily Delta flows, Delta Wetlands Project operating capacities, CVP and SWP operations, Delta water quality, and quality of water stored on the Delta Wetlands Project islands. Collectively, the elements of the draft WQMP would provide the urban water utilities with the necessary assurances that the Delta Wetlands Project would be operated in a manner that will ensure the protection of public health and long-term integrity of drinking water supplies diverted from the Sacramento-San Joaquin Delta.

The parties have made good progress toward completion of a WQMP which would provide the basis for CUWA and Delta Wetlands to enter into a stipulated agreement that confirms that the Delta Wetlands Project would be operated in strict accordance with the terms and conditions of the final WQMP. **R4-1 cont'd**

CUWA's comments on the DREIR/S are intended to accomplish three purposes: (1) provide information to address deficiencies in the analysis of the potential effects of the Project; (2) document our concerns related to the proposed thresholds of significance for water quality parameters of concern; and (3) recommend specific revisions to the thresholds of significance that address CUWA's concerns and bring the analysis of the Project effects into conformity with the approach used by CUWA and Delta Wetlands in the draft WQMP.

CUWA also has concerns about the effects of the Delta Wetlands Project on: (1) fish that migrate through or reside in the Delta and (2) surrounding levees that protect the water supply infrastructure for millions of people. Additional protective measures are needed to minimize effects on fisheries, and a better plan for monitoring groundwater levels and taking corrective action is needed to adequately protect levees from adverse effects. Individual member agencies will submit detailed comments on these topics.

Thresholds of Significance for Water Quality Parameters of Concern

We note that the significance criteria used in the DREIR/S for total organic carbon (TOC)[2], salinity (expressed as electrical conductivity, or EC)[3], chloride[4] and bromide[5] are **R4-2**

[2] Increases in export DOC of more than 20% of the mean DOC (3.8 mg/L), or about 0.8 mg/L, are considered to be significant water quality impacts.

[3] If Project operations caused the value for EC to exceed 90% of the numerical standard for EC, the effect was considered to be a significant impact. Additionally, increases in export EC of more than 20% of the applicable standard was considered to be a significant impact. The applicable objectives for EC at the export locations varies seasonally from 450 mg/L or 700 mg/L at the export locations.

[4] If Project operations caused the value for chloride to exceed 90% of the numerical standard for chloride, the effect was considered to be a significant impact. Additionally, increases in export chloride of more than 20% of the applicable standard was considered to be a significant impact. The applicable objectives for chloride vary seasonally at the export locations from 150 mg/L to 250 mg/L.

the same as those used in the 1995 DEIR/S. During the 1997 water rights hearing for the Project, CUWA expressed serious concerns regarding the adequacy of the 1995 DEIR/S significance criteria for water quality. These concerns were based on the fact that the central Delta is already severely impaired for these constituents and that the proposed thresholds of significance allow excessive degradation of water quality in conflict with long-term environmental goals for the Delta and would result in severe economic and environmental impacts to municipal water users. The arguments included in the DREIR/S in favor of continued use of these thresholds have not alleviated our concerns in this regard.

The DREIR/S cites natural variability, measurement errors and modeling uncertainties and CEQA guidance related to economic impacts and adopted standards in support of the continued use of the 1995 DEIR/S thresholds. The DREIR/S states that "based on professional experience," natural variability was assumed to be 10% of the specified numerical standard for variables with numerical standards; or 10% of the mean value for variables without numerical standards. Measurement errors and modeling uncertainties were likewise assumed to be about 10% of the numerical standard for variables with numerical standards; or 10% of the mean value for variables without numerical standards. Then, it is assumed that the natural variability, measurement errors and modeling uncertainties can simply be added together to establish the thresholds of significance that would be used to analyze the Project effects. For purposes of analyzing Project impacts in the DREIR/S, water quality degradation of up to 20% of the adopted standards for parameters of concern are considered insignificant.[6] Additionally, for those parameters that do not have adopted water quality objectives, increases of up to 20% of the average ambient concentrations are considered insignificant.[7]

R4-2 cont'd

CUWA finds that the impacts to municipal water users associated with 20% increase in water quality degradation for each of the parameters of concern are both excessive and unnecessary. We are also troubled that there is no quantitative or qualitative evidence to support the threshold, and that the DREIR/s assumes that the cumulative effect of the maximum natural variability, measurement errors and modeling uncertainties can simply be added together to analyze the effects of the Project. In the discussion that follows, we have identified specific concerns with the current approach to the thresholds of significance and recommend corrective measures.

---

[5] Increases in export bromide of more than 20% of the equivalent chloride standards, using the bromide to chloride ratio, are considered to be significant water quality impacts. Under this formula, a change of 100 μg/L to 170 μg/L bromide at the export locations is considered to be a significant water quality impact.

[6] Parameters of concern with adopted water quality objectives include: EC, chloride, bromate and THMs. Under the significance criteria used in the DEIR, increases of up to 90 to 140 mg/L EC (objective varies seasonally) and 30 mg/L to 50 mg/L chloride (objective varies seasonally) and 16 μg/L THMs are considered less than significant. The DREIR/S did not analyze bromate formation so no significance criteria was provided for this parameter.

[7] Parameters of concern without adopted water quality objectives include DOC and bromide. Under the significance criteria used in the DEIR, increases of up to 0.8 mg/L DOC and 100 μg/L to 170 μg/L bromide are considered less than significant.

Natural Variability

The DREIR/S states that "based on professional experience," natural variability was assumed to be 10% of the specified numerical standard for variables with numerical standards; or 10% of the mean value for variables without numerical standards. We find no basis for considering natural variability in establishing the thresholds of significance for the water quality parameters of concern. As explained in the description of the DREIR/S mitigation measures, "Delta Wetlands operations would be regulated based on information from *real-time monitoring* of actual daily Delta flows, Delta Wetlands Project operating capacities, CVP and SWP operations, Delta water quality, quality of water stored on the Delta Wetlands Project islands, and fisheries."[8] Reliance on real-time monitoring to trigger adjustments to Delta Wetlands' operations in response to adopted mitigation requirements would eliminate the uncertainty associated with natural variability. Currently, the DREIR/S fails to provide documentation to support the assumption that the real-time natural variability for the parameters of concern is ±10%. The DREIR/S must be revised to disclose the basis of this assumption and the rationale as why additional loading of parameters of concern up to the level of natural variability is considered insignificant. If this assumption cannot be supported, this variable must be stricken from consideration in establishment of the significance criteria. **R4-3**

Measurement Errors and Modeling Uncertainties

The DEIR/S states that measurement errors and modeling uncertainties were assumed to be about 10% of the numerical standard for variables with numerical standards; or 10% of the mean value for variables without numerical standards. CUWA and Delta Wetlands have spent the last twelve months developing a draft water quality management plan (WQMP) to address the potential water quality impacts associated with Project operations. Similar to the mitigation plan provided in the DREIR/S, the draft WQMP provides that the Delta Wetlands operations would be regulated based on information from real-time monitoring and modeling of actual daily Delta flows, Delta Wetlands Project operating capacities, CVP and SWP operations, Delta water quality, and quality of water stored on the Delta Wetlands Project islands. The draft WQMP is intended to provide the urban water utilities with the necessary assurances that the Delta Wetlands Project will be operated in a manner that will ensure the protection of public health and long-term integrity of drinking water supplies diverted from the Sacramento-San Joaquin Delta. **R4-4**

Under the WQMP, the significance criteria would be based on real-time field measurements and theoretical computer modeling results, both of which have limited accuracy and confidence intervals. CUWA and Delta Wetlands have agreed in concept that for purposes of determining changes, baseline confidence intervals of ± 5% will be assumed. Thus, for the purposes of providing mitigation of long-term water quality impacts pursuant to the WQMP, no mitigation would be required if the net increase in TOC, TDS, bromide or chloride is 5% or less. However, should the net increase in TOC,

[8] Page 4-45 of the DREIR/S, emphasis added.

TDS, bromide or chloride be greater than 5%, Delta Wetlands would be required to mitigate the increase in TOC, TDS, bromide and chloride loading.

CUWA recommends that the lead agencies use the same rationale to establish the thresholds of significance to be used in the Final REIR/S (5% of the numerical limits for water quality variables with numerical limits and 5% of the mean value for variable without numerical limits). Under this approach, increases of up to 0.2 mg/L DOC, 22 to 35 mg/L EC, 8 mg/L to 13 mg/L chloride, and 25 μg/L to 42 μg/L bromide are considered less than significant. **R4-4 cont'd**

Economic Impacts

The DREIR/S cites the first sentence in CEQA Guidelines Section 15064(e), which states that "[e]conomic changes resulting from a Project "shall not be treated as significant effects on the environment," in support of the statements on pages 4-32, 4-34 and 4-44 that CEQA does not require a significance determination of the economic impacts on Municipal water utilities and 22 million consumers they serve stemming from increase DOC loading due to Project operations. In reaching these conclusions, the DREIR/S fails to consider important CEQA principles that distinguish between economic and social effects which do not constitute significant environmental impacts; and those physical effects which can constitute significant impacts. Consider, for example, the rest of Section 15064(e) that was omitted from the discussion in the DREIR/S:

> Economic or social changes may be used, however, to determine that a physical change shall be regarded as a significant effect on the environment. Where a physical change is caused by economic or social effects of a Project, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the Project. Alternatively, economic and social effects of a physical change may be used to determine that the physical change is a significant effect on the environment if the physical change causes adverse economic or social effects on people, those adverse effects may be used as a factor in determining whether the physical change is significant.

R4-5

In addition, CEQA Guidelines Section 15131(b) provides that "[e]conomic or social effects of a Project may be used to determine the significance of physical changes caused by the Project."

Thus, contrary to what is stated in the DREIR/S, CEQA requires consideration of the environmental, economic and social effects of the Delta Wetlands Project in determining whether the physical effects of the increases of DOC concentrations caused by Project operations are significant. This evaluation must include an assessment of the following potential impacts that have been excluded in the DREIR/S:

1) Physical changes that cause adverse economic and social effects on people.
   a) Increased water treatment costs.

b) Increased incidence of permit violations.
c) Affect of increased concentrations of TOC and THMs on public attitudes regarding the safety of drinking water supplies.

2) Physical changes that are caused by economic or social effects of the Project.
   a) Risk associated with hauling additional chemicals and acid used for TOC removal through urban communities.
   b) Discretionary income of the utility and its consumers redirected to water treatment costs.

3) Physical changes that causes adverse environmental impacts.
   a) Increased incidence of cancer and reproductive health impacts.
   b) Increased incidence of permit violations.
   c) Increased pressure on CALFED goal to reduce TOC concentrations in the Delta and THM concentrations in drinking water supplies.

R4-5 cont'd

Analysis of Project Effects on Water Quality, Urban Water Agencies and the Public

Relative Contribution of DOC

The DREIR/S notes that the combined Delta lowlands contribute 40% of the DOC at the southern export facilities. Using the 3.8 mg/L average DOC concentration at the export locations, Delta lowlands, which include Bacon Island and Webb Tract, contribute 1.6 mg/l of the 3.8 mg/L, or 42% of the average concentration. Unpublished data from a forthcoming the Department of Water Resources Municipal Water Quality Investigations (MWQI) unit report entitled "Water Quality Benefits from controlling Delta Island Drainage (Marvin Jung Fall 2000), indicate a potential reduction in agricultural drainage from candidate regions in the Delta could equal approximately a 0.8 mg/L reduction in DOC at the export locations. The estimated cost to achieve a DOC reduction of 0.8 mg/l is $278 to $411 million dollars for capital facilities and $11 million per year for operation and maintenance. This information provides further support for CUWA's position that the threshold of significance for DOC in the DREIR/S is misplaced. The MWQI data demonstrates that the proposed 20% threshold of significance for DOC increases due to Delta Wetlands Project operations would result in a 50% increase in the combined DOC contributions from the Delta lowlands at the export locations and could completely erase the benefits of a several hundred million dollar investment in DOC control facilities before the impact would be considered significant.

R4-6

Revised Drinking Water Regulations and Source Water Protection Requirements

We find the discussion of current and proposed drinking water standards on pages 4-26 and 4-27 to provide an inadequate assessment of the potential impact of Delta Wetlands Project operations on municipal water users. To be adequate under CEQA and NEPA, the REIR/S must consider the following in establishing thresholds of significance and assessing the Project's effects on urban water agencies and their customers:

R4-7

> In 1996, the United States Congress reauthorized the Safe Drinking Water Act. As part of that reauthorization, Congress mandated that the U.S. EPA promulgate

Stage 1 and Stage 2 of the Disinfectants/Disinfection By-Product (D/DBP) Rule by November 1998 and May of 2002, respectively. The D/DBP Rule calls for significant lowering of the allowable concentrations of trihalomethanes (THMs), bromate and other disinfection by-products (DBPs) in drinking water and for the first time in the history of the Safe Drinking Water Act, TOC has been identified as a contaminant that drinking water utilities will be required to remove from their source waters.

The Stage 1 Rule, promulgated in November 1998, requires drinking water utilities to reduce influent TOC. For utilities diverting drinking water supplies from the Delta, this new rule requires twenty-five % of the TOC in the influent to the water treatment plant be removed when the Delta TOC concentration is between 2.0 and 4.0 mg/L. If the Delta TOC concentration is greater than 4.0 mg/L, the utilities are required to remove thirty-five % of the influent TOC. The ambient TOC concentrations of Delta water are generally greater than 4.0 mg/L in the winter months and slightly less than 4.0 mg/L during the summer. Left unmitigated, the cumulative impact of TOC discharges from Delta Wetlands to the Delta could increase the frequency of exceedance of the 4.0 mg/L TOC standard and lead to additional treatment cost for the drinking water utilities on the order of millions of dollars per year.

For utilities employing conventional treatment, the higher TOC concentrations could be problematic, as they would be unable to increase TOC removal without significant capital investment and increased operation and maintenance cost. For water utilities employing ozone as their primary disinfectant, the likely impact of higher TOC concentrations is a significant increase in ozone demand, which would result in higher operational costs and increased bromate formation. Regardless of the type of treatment employed, increases in TOC levels in source water can have significant impacts on water treatment operations and DBP and bromate levels in drinking water supplies. **R4-7 cont'd**

Under Stage 1 water utilities are also required to reduce the concentration of THMs in their treated water from the previous standard of 100 μg/L to 80 μg/L. The discharge of increased quantities of THM precursors to the Delta would make it more difficult for CUWA members who rely on Delta supplies to comply with THM standards and could increase the human health risks associated with the production of THMs and other DBPs in treated drinking water. TOC and bromide are the DBP precursors in Delta waters that present the greatest health and regulatory concerns. Disinfection of drinking water supplies containing elevated concentrations of TOC or bromide results in the formation of hundreds of DBPs. Exposure to these chemical by-products of drinking water disinfection is suspected to cause cancer. Other DBPs may cause adverse developmental and reproductive effects. Thus, even short-term spikes in TOC and DBPs could be sufficient to trigger serious public health impacts.

The CALFED Bay-Delta Program is considering integration of the Delta Wetlands Project as an integral component of the Bay-Delta solution.[9] The Framework for Action includes CALFED's long-term goals for drinking water quality improvement of 3.0 mg/L for total organic carbon (TOC) and 50 ug/L for bromide. In addition to these long-term TOC and bromide targets, CUWA has recommended CALFED adopt the following interim water quality milestones:

1)	by 2002:	Bromide concentration < 300 μg/L TOC concentration < 4.0 mg/L
2)	by 2005 - 2007:	Bromide concentration < 100-150 μg/L TOC concentration < 3.5 mg/L
3)	by 2007:	Total dissolved solids < 220 mg/L
4)	by full implementation:	Total dissolved solids < 150 mg/L TOC concentration < 3.0 mg/L Bromide concentration < 50 μg/L

These recommended milestones were based on specific assumptions about the future state of drinking water treatment technology and regulations, including the Stage 2 Disinfectants/Disinfection by-Products (D/DBP) Rule. Although there is still substantial uncertainty surrounding these assumptions, some elements of the Stage 2 D/DBP Rule are emerging through the current FACA process.

R4-7 cont'd

The Federal Advisory Committee Act (FACA) negotiators have agreed that Stage 2 will retain many of the numerical D/DBP standards established in Stage 1 (i.e., 80 μg/L total trihalomethanes [TTHMs], 60 μg/L for the sum of five haloacetic acids [HAA5]). However, the proposed Location Running Annual Average (LRAA) eliminates the spatial averaging in the distribution system, and will require greater control of the DBP precursors (TOC and bromide). Nationwide analyses in support of the FACA negotiations have shown that a 80 μg/L LRAA for TTHMs is equivalent to a 67 μg/L (or lower) standard under the current Running Annual Average compliance requirement. Precursor control will, therefore, be similar to what would have been required had the Stage 2 standards been lowered to the levels indicated on Page 4 of the DREIR/S.

Other elements of the Stage 2 Rule are less certain. Because of the growing body of research evidence that brominated DBPs (e.g., bromate, bromodichloromethane) may pose a greater health risk than other DBPs, it is likely the Stage 1 bromate standard will be lowered in Stage 2, or in subsequent stages of EPA efforts to control D/DBP levels in drinking water. For example, the FACA is considering lowering the bromate standard from 10 to 5 μg/L.

Given the uncertainty over what level of precursor control will be required in Stage 2 and subsequent D/DBP regulations, it is critical that the REIR/S evaluate the potential impacts of Delta Wetlands Project operations on the intermediate

[9] CALFED Bay-Delta Program, "California's Water Future: A Framework for Action," June 9, 2000.

and long-term Delta water quality performance measures outlined above. It is important that the REIR/S establish thresholds of significance and mitigation strategies that are tied to agencies' ability to cost-effectively comply with drinking water regulations. We recommend that the lead agencies consider the interim milestones recommended by CUWA and the long-term water quality milestones adopted by CALFED along with other information that will be used to establish the thresholds of significance for the final REIR/S. **R4-7 cont'd**

Increases in DOC/TOC Concentrations in the Delta and Resultant DBP Formation

The Project effects on TOC and bromide concentrations at the urban intakes could have significant adverse impacts on the 22 million people receiving their water from the Delta by increasing bromate, trihalomethanes, haloacetic acids, and other disinfection by-products produced during the water treatment process, resulting in an increased risk to public health and increased costs to water utiltities. CEQA Guidelines subsection §15065(d) requires an EIR evaluate all aspects of a proposed project that may cause substantial adverse effects on human beings, either directly or indirectly.

Water stored on a shallow reservoir over an extended period of time will increase in salinity and organic carbon concentration. The peat soil on the Project islands and the high nutrients concentration in Delta water further accelerate the build up of organic carbon concentration in the stored water and increase the organic carbon concentration at Delta drinking water intakes when the stored water is released. The DREIR impact analysis does not analyze the full range of potential organic carbon concentration in Project stored water and assess the corresponding increase at Delta intakes when the water is released. **R4-8**

Substantial data on organic carbon production in wetlands and in shallow water reservoirs on peat soil were presented in the 1997 water rights hearing for the Project. Furthermore, extensive testimony was provided on the rate of release of organic carbon from Project islands, in particular on the seasonal variation, quantity, and potential decrease after initial filling. Despite this wealth of information, the RDEIR/S does not evaluate a reasonable range of impacts on organic carbon concentration at the intakes and the corresponding increase in disinfection by-products resulting therefrom.

The available information shows a wide range of organic carbon loading and large seasonal variations. It also shows that, even at a high rate of organic carbon release from the peat soil, the amount of carbon released from the soil is only a small percentage of the carbon content in the top layer of peat soil. Thus, we question the assumption made in the DREIR/S that the rate of organic carbon release will decrease appreciably after initial fillings on Project reservoirs.

The evaluation of organic carbon loading and Project impacts on disinfection by-products in the RDEIR/S is deficient in a number of aspects:

- The Revised Draft EIR/EIS does not evaluate the effects of seasonal variation of Project impacts. The analysis assumes that the rate of carbon release is constant, which ignores algae and macrophytes in the reservoirs which could be significant sources of dissolved and particulate organic carbon in Project reservoirs. These sources are highly seasonal and peak in their production of DOC in the summer, just prior to the time of releases from Project reservoirs in most years. Organic carbon release from peat soil also increases with temperature, which is highest in the summer. Ignoring this seasonal variation may lead to significant underestimates of DOC concentration in reservoir water at times of release.

- The three different organic carbon loading rates (at 1, 4, and 9 gm/m^2/month) analyzed in the Revised Draft EIR/EIS do not adequately represent the range presented in the water rights hearing. Potential loading rate could be much higher. For example, Contra Costa Water District (CCWD) Exhibit 10 in the water right hearing shows that the average rate of organic carbon release from the peat soil alone could be up to 13 gm/m^2/month. CUWA Exhibit 6 discusses that primary productivity of emergent plant communities could be up to 2,250 gm/m^2/year (or an "average" of 188 gm/m^2/month, if seasonal variation is ignored). Thus, the highest loading rate analyzed in the Revised Draft EIR/EIS, at of 9 gm/m^2/month, could significantly underestimate DOC loading on the reservoir islands.

- The Revised Draft EIR/EIS provides an incorrect evaluation of the organic carbon loading rates that could be deduced from the "SMARTS" experiments. It misinterprets the experiment set-up and conditions and underestimates the rate of organic carbon loading in two ways: **R4-8 cont'd**

  1. The estimates in the RDEIR/S are based on the assumption that organic carbon concentration in the tank water will cease to increase at the end of the experiment. This underestimates the rate of organic carbon loading in the experiments. For example, the Revised Draft EIR/EIS assumes that the total annual organic carbon load from the tanks in "SMARTS 1" would be the same as the load released in the 12-weeks duration of the experiment, in spite of the continuous increase in organic carbon concentration after the 12 weeks reported in a similar but of longer duration experiment "SMARTS 2".

  2. The RDEIR/S underestimates the rates of organic carbon load that could be estimated from "SMARTS 1". It ignores results from those tanks with higher rates, asserting that "... load estimates obtained from the flushing (flowing water) tanks are questionable" (page 4-18). The "SMARTS" results from the flowing tanks are more appropriate for use in the REIR/S. The equivalent range of monthly loads would be 17 – 37 gm/m^2/month. The largest rate assumed in the Revised Draft EIR/EIS of 9 gm/m^2/year is smaller than the range estimated from "SMARTS 1" by a factor of between 2 and 4.

Generally, Delta water has a TOC of greater than 4.0 mg/L in the winter and under the Stage 1 Rule, a 35 % TOC removal is required under these conditions. In the summer,

the TOC concentration is typically lower than 4.0 mg/L which reduces the TOC removal requirement to 25%. The DREIR/S states that Delta Wetlands Project operations would result in reservoir discharges typically in the months of July through September. Based on the proposed thresholds of significance, these discharges could increase the TOC of exported water by up to 0.8 mg/L without causing a "significant impact." Under these conditions, the TOC concentrations at the export locations would likely exceed 4.0 mg/L, thus, Delta Wetlands Project operations may increase the TOC removal requirement at the water treatment plant from 25 % to the more costly 35 %.

Approximately 30 mg/L of alum--with a sufficient amount of acid addition to lower the pH to 6.3--would be required to reliably remove 25 % of the TOC in Delta water. Whereas, 40 mg/L of alum at pH 5.5 would be needed to reliably achieve a 35% TOC removal. The additional treatment costs to meet these enhanced coagulation requirements in Delta water are $26.10/acre-ft and $39.15/acre-ft, depending on whether the influent TOC is less than or greater than 4.0 mg/L, respectively based on estimated cost of drinking water treatment provided by the Metropolitan Water District of Southern California. Additionally, whenever there is an increase in TOC, the disinfectant demand of the water increases. Thus, more chlorine or ozone is required to meet the disinfection requirements. The higher disinfectant dose results in both increased operating costs and higher DBP formation. **R4-8 cont'd**

As stated above, the CEQA Guidelines require that the REIR/S include an evaluation of Project effects on DOC loading and the potential impacts on public health and water utility operations. We feel strongly that one of the objectives of thresholds of significance used to evaluate the impact of increased DOC loading should be to ensure, within a reasonable margin of error (in the Draft WQMP CUWA and Delta Wetlands are using ±5%), that Delta Wetlands Project operations do not cause TOC at the export pumps to exceed 4.0 mg/L. Such a restriction would be consistent with a fundamental principle of CEQA, which provides that Project impacts that substantially degrade water quality are potentially significant.[10] To be considered adequate under CEQA, the thresholds of significance used in the REIR/S must include reasonable controls on Project TOC contributions at the export locations as follows:

1. Delta Wetlands Project operations shall not cause TOC concentrations at the urban intakes to exceed 4.0 mg/L; and
2. Delta Wetlands Project operations shall not cause TOC concentrations at a water treatment plant to exceed 4.0 mg/L.

THM Impacts

The Project effects on TOC and bromide concentrations at the urban intakes could have significant adverse impacts on the 22 million people receiving their water from the Delta by increasing bromate, trihalomethanes, haloacetic acids, and other disinfection by-products produced during the water treatment process, resulting in an increased risk to **R4-9**

[10] *See,* CEQA Guidelines Appendix G, Section VIII(f).

public health and increased cost of water utility operations. CEQA Guidelines subsection §15065(d) requires an EIR evaluate all aspects of a proposed project that may cause substantial adverse effects on human beings, either directly or indirectly.

CUWA does not agree with the changes made to the Malcolm-Pirnie equation for total trihalomethanes ("TTHMs") production in the Revised Draft EIR/EIS (Appendix G, pages G-16 to G-18). The original equation was developed based on rigorous scientific analysis, whereas no basis has been provided to justify the changes made to the equation for use in the RDEIR/S. No information is provided to support the assumption in the RDEIR/S that the "basic chemistry" requires that the TTHMs concentration would double if the bromide concentration is to increase from 0.05 mg/L to 1.00 mg/L.[11] In fact, the Malcolm-Pirnie equation, which was developed from actual data, suggests otherwise. **R4-9 cont'd**

As the Malcolm-Pirnie equation (page G-17) illustrates, TTHM formation depends on a number of factors such as pH, chlorine dose, and temperature in addition to the concentrations of organic carbon and bromide. To properly identify the effects of bromide alone on a single plot of TTHM versus bromide, the values of each of the other factors have to be identical. It is not clear if the data used in Figure G-10 are all obtained under the assumed pH, temperature, dissolved organic carbon concentration, chlorine dosage and contact time. If not, the comparisons would be meaningless. The REIR/S must clearly disclose the actual values of these factors used in the analysis.

Because of the changes to the equations, the RDEIR/S may not adequately disclose potentially significant Project effects. The analysis must be revised and the proper formulae and analyses must be used to adequately disclose the Project effects.

Page 4-33 of the DREIR/S states the significance thresholds for THMs are set to be "more stringent than the adopted standards" and therefore exceed the expectations of

[11] A high bromide concentration has two impaccts on TTHMs formation. Firstly, THMs-Br weigh more. Secondly, bromide, when oxidized by chlorine (HOCl) to hypobromous acid (HOBr), can result in the formation of more molecules of THMs than chlorine does. This second effect was not considered in the reasoning in the Revised Draft EIR/EIS.

Trussell and Umphres (in: "The Formation of Trihalomethanes", *Journal of American Water Works Association*, volume 70, part 11, p.604, November 1978) found that the mole-concentration of TTHMs produced per mole of TOC in water chlorinated was related to the ratio of the mole-concentration of bromide incorporated into TTHMs (THM-Br) and the moles of TOC present. They found that the concentration of bromide in the source water influenced the rate of the TTHM reaction as well as the TTHM yield. That is, the rate of TTHM formation was higher in water with a higher bromide concentration.

Amy and colleagues (in: Amy, Gary L.; Lo Tan; & Marshall K. Davis, "The Effects of Ozonation and Activated Carbon Adsorption on Trihalomethane Speciation", *Water Research*, volume 25, part 2, page 191, February 1991) found that HOCl functions as a more effective oxidant, whereas HOBr behaves as a more efficient halogen substitution agent. They performed THMFP tests and observed that, in general, less than 10% of the HOCl became incorporated into the TTHMs (THM-Cl), whereas as much as 50% or more of the bromide became incorporated into THM-Br. In addition, they found that as the concentration ratio of bromide to TOC increased, the percentage of other brominated disinfection by-products increased.

CEQA and NEPA.[12] CUWA does not agree that the significance thresholds for THMs are adequate to prevent substantial adverse effects on human beings, either directly or indirectly. To reliably ensure compliance with the current THM standard of 80 μg/L, drinking water utilities strive to consistently maintain TTHM concentrations of less than 64 μg/L in finished drinking water supplies.

To be considered adequate under CEQA, the thresholds of significance used in the REIR/S must include reasonable controls on Project impacts on THM formation at water treatment plants as follows: **R4-9 cont'd**

1. Delta Wetlands Project operations shall not cause or contribute to a predicted monthly average TTHM concentrations in drinking water in excess of 64 μg/L, as calculated in the raw water of an urban intake in the Delta; and
2. Delta Wetlands Project operations shall not cause or contribute to predicted monthly average TTHM concentrations in drinking water in excess of 64 μg/L, as calculated from measurements at the outlet of a water treatment plant.

Increase in Bromide Concentrations in the Delta and Resultant DBP Formation

The Project effects on bromide concentrations at the urban intakes could have significant adverse impacts on the 22 million people receiving their water from the Delta by increasing bromate, trihalomethanes, haloacetic acids, and other disinfection by-products produced during the water treatment process, resulting in an increased risk to public health and increased cost of water utility operations. CEQA Guidelines subsection §15065(d) requires an EIR evaluate all aspects of a proposed project that may cause substantial adverse effects on human beings, either directly or indirectly.

The lead agencies' work plan for the REIR/S directed Jones and Stokes and Associates (JSA) to use the Ozekin equation to model the impact of Delta Wetlands Projects operations on bromate formation. Yet, page 4-30 of the DREIR/S states that the potential effects of the Delta Wetlands Project operations on bromate concentration are not calculated because no reliable relationship between bromate and DOC or bromide could be identified. **R4-10**

The lead agencies requested the CUWA's assistance in identifying our member agencies' water treatment plants that receive Delta water, currently having monitoring programs for raw water (i.e., bromide, and total organic carbon (TOC)) and DBPs, and cover the range of currently used treatment processes. At the August 10, 1999 Delta Wetlands Project status meeting the State Board narrowed the scope of this request. At that meeting, CUWA was asked to provide water treatment plant operational data suitable to validate and calibrate the Malcolm Pirnie, Inc. (MPI) total THM (TTHM) formation equation and the Ozekin bromate formation equation for Delta waters. On August 25, 1999, CUWA

[12] For the DREIR/S analysis, the lower of two significance criteria controlled: (1) exceedances of 72 μg/L (90% of the current THM standard of 80 μg/L) or changes of greater than 16 μg/L (20% of 80 μg/L).

submitted a comprehensive response to the lead agencies' request for assistance in identifying and collecting available data pertaining to bromate formation at municipal treatment plants.

CUWA submitted information (three data files) to the lead agencies and Mr. Russ Brown of JSA that could be used to validate and calibrate the THM and bromate equations. The files contain data from the Metropolitan Water District of Southern California's (MWD) simulated distribution system testing that can be used to validate and calibrate the TTHM equation and ozone and bromate data from MWD's demonstration plant as well as Santa Clara Valley Water District's (SCVWD) pilot plant.

CUWA agrees with the statement on page G-19 that evaluation of the bromate formation data indicates that the Ozekin equation tends to over-predict bromate formation. This is why CUWA recommended that JSA use the MWD and SCVWD data to calculate a correction factor to address the tendency of this equation to over-predict bromate formation. This recommendation parallels the approach used by the U.S. Environmental Protection Agency (EPA) in its evaluation of the bromate formation data to generate information to be used by the FACA for considering lowering the bromate standard from 10 to 5 μg/L under Stage 2. Thus, EPA and the FACA have accepted that it is possible to correct the Ozekin equation to source water characteristics so to reliably predict bromate formation in support of a national rule making process. Consequently, we do not agree with the statement on page G-19 that "[b]ased on the lack of any observed relationship between bromate formation and Br or DOC concentrations in source water, it was determined that the impact analysis should ... not try to predict changes in bromate concentrations expected in drinking water treated by O3." **R4-10 cont'd**

In light of the EPA's willingness to embrace the reliability of the Ozekin equation, as corrected against source water data, we find omission of the bromate formation analysis to be completely unacceptable and urge the lead agencies fully investigate the impact of Delta Wetlands Project operations on bromate concentrations in municipal water supplies treated with ozone.

A significant shortcoming in the DREIR/S is the omission of a threshold of significance thresholds for bromate. CUWA does not agree with the assumption that the significance criteria for bromide is sufficient to control impacts due to Delta Wetlands operations on bromate formation. To reliably ensure compliance with the current bromate standard of 10 μg/L, drinking water utilities strive to consistently maintain bromate concentrations of less than 8 μg/L in finished drinking water supplies.

As stated above, the CEQA Guidelines require that the REIR/S include an evaluation of Project effects on bromate formation and the potential impact on public health and water utility operations. Thus, to be considered adequate under CEQA, the thresholds of significance used in the REIR/S must include reasonable controls on Project impacts on THM and bromate formation at water treatment plants as follows:

1. Delta Wetlands Project operations shall not cause or contribute to predicted monthly average bromate concentrations in drinking water in excess of 80% of the adopted bromate standard (currently 8 μg/L), as calculated in the raw water of an urban intake in the Delta; and
2. Delta Wetlands Project operations shall not cause or contribute to predicted monthly average bromate concentrations in drinking water in excess of 80% of the adopted bromate standard (currently 8 μg/L), as calculated from measurements at the outlet of a water treatment plant.

R4-10 cont'd

Salinity Impacts

Total dissolved solids (TDS) and chloride concentrations are also of concern to the drinking water utilities. Under current Delta operating criteria, elevated TDS concentrations in the Delta result in the Central Valley Project (CVP) and State Water Project (SWP) having to release additional water from storage to comply with Delta water quality standards. TDS in Delta water would also have an adverse impact on water management programs of the CUWA agencies; most notably water recycling and groundwater storage programs. Collectively, CUWA members and their sub-agencies have invested over a billion dollars in capital facilities to maximize their water recycling and groundwater storage opportunities. The success of these water management programs is contingent upon the continued availability of acceptable quality water from the Delta.

R4-11

Local and regional water planning and regulatory decisions have been based upon SWP contract provisions which specifies a TDS objective of 220 mg/L on average for any ten-year period and 440 mg/L for any month. Over the last ten years, TDS concentrations of the SWP have frequently exceeded the 220 mg/L objective. CALFED has initiated a process to provide a rationale for establishing water quality targets and interim milestones for TDS in the Delta. CUWA's Board of Representatives recently adopted a salinity management policy to guide CUWA's participation in the CALFED Water Quality Program.[13] This policy is based on a study assessing the impacts of the salinity of Bay-Delta supplies on urban water agencies and their customers. A copy of CUWA's salinity impact study is included as an attachment hereto.[14]

CUWA is concerned that the model used for salinity simulation (DeltaSOQ) may not accurately predict salinity impacts on urban utilities. We recommend the salinity impact

[13] CALFED should provide for a level of salinity in water diverted from the Delta which supports CALFED recycling and conjunctive use goals in the most cost-effective manner; minimizes dry-year water demands on the Delta; and provides for blended drinking water TDS levels of no more than 500 mg/L. CALFED should adopt a short-term salinity target of 220 mg/L to be met at urban diversion points by the end of Stage 1 and a long-term salinity target of 150 mg/L to be met at urban diversion points by 2020. Alternatively, CALFED should achieve an equivalent level of salinity reduction within the urban agencies' service areas through a cost-effective combination of source control; blending with higher quality sources; treatment technologies; and improved state and federal operations.

[14] California Urban Water Agencies, "Recommended Salinity Targets and Program Actions for the CALFED Water Quality Program," December 1999.

modeling be revised as suggested in the comments submitted by Contra Costa Water District.

To be considered adequate under CEQA, the thresholds of significance used in the REIR/S must include reasonable controls on the Project to avoid salinity impacts caused by Delta Wetlands discharges from the reservoir islands: **R4-11 cont'd**

1. Delta Wetlands discharges shall not cause a monthly average increase in EC or chloride at a Delta export location in excess of 5%;
2. Delta Wetlands discharges shall not cause an increase in chloride at the export locations of greater than 10 mg/l; and
3. Delta Wetlands discharges shall not cause salinity levels at the export locations to exceed 90% of an adopted a salinity standard.

Cumulative Impacts

CEQA Guidelines subsection 15130(b)(1) provides that an EIR should include an evaluation of the cumulative effects of the proposed Project in conjunction with reasonably foreseeable projects that may result related or cumulative impacts, including projects outside the control of the agency. Thus, the REIR/S must include an evaluation of the cumulative effects of increased TOC, DBP and salt loading in drinking water supplies, including, but not limited to the following future projects: CALFED's plans for wetlands restoration in the Delta, Sacramento Regional County Sanitation District, City of West Sacramento, City of Tracy Wastewater Treatment Plant expansions, and the proposed Mountain House and Discovery Bay wastewater treatment plant discharges. **R4-12**

Mitigation

CEQA and NEPA require an EIR/EIS to propose adequate and practicable mitigation measures in sufficient details for all significant and potentially significant impacts. The proposed mitigation strategy presented in the DREIR/S calls for real-time monitoring of Delta Wetlands operations and imposition of operational constraints as necessary to prevent exceedances of the significance thresholds for the drinking water parameters of concern. Assuming the thresholds of significance are modified in accordance with the recommendations herein, the proposed mitigation strategy is consistent with that proposed in the WQMP for addressing short-term impacts due to Project operations. However, the lead agencies should also consider the need to mitigate long-term water quality impacts so to ensure that the Project effects on Delta water quality do not have an adverse impact on CALFED's goals and objectives for continuous improvement in Delta water quality for drinking water parameters of concern. **R4-13**

Conclusion

CUWA finds that the analysis contained in the DREIR/S is helpful in beginning to address some of the unresolved water quality issues. However, the discussion in Chapter 4 and Appendix G and the thresholds of significance used to support the analysis of the **R4-14**

Project impacts fall short of the objectives set forth in the SWRCB's November 25, 1998 letter to the applicant outlining the need for further review of the water quality issues. Consequently, we recommend that the lead agencies revise Chapter 4 and Appendix G to address these comments and re-circulate the REIR/S among the interested parties for further review and comment. This will ensure that an adequate investigation of the potential Project effects on municipal water utilities and their customers has been conducted, and will lead to identification of reasonable mitigation of those impacts that are determined to be significant. **R4-14 cont'd**

Thank you for the opportunity to comment on the DEIR/S. We look forward to working with the lead agencies and Delta Wetlands on the resolution of the issues identified herein.

Sincerely,

Lyle N. Hoag
Interim Executive Director

Recommended Salinity Targets and Program Actions

For the CALFED Water Quality Program

Prepared by

California Urban Water Agencies

December, 1999

California Urban Water Agencies

R4-1. The comment indicates that CUWA has been working with Delta Wetlands to prepare a WQMP that will "provide urban water utilities with the necessary assurances that the Delta Wetlands Project would be operated in a manner that will ensure the protection of public health and long-term integrity of drinking water supplies diverted from the Sacramento-San Joaquin Delta". In October 2000, Delta Wetlands submitted the final WQMP to the SWRCB as part of an agreement between Delta Wetlands and CUWA to resolve CUWA's concerns about project effects on water quality. The WQMP describes the measures that Delta Wetlands has agreed to implement to limit potential effects of the project on drinking water quality and treatment plant operations. By agreeing to implement the WQMP, Delta Wetlands has agreed to implement a comprehensive monitoring plan and restrict discharges when necessary to limit project effects on DOC, THMs, and other water quality variables. The Delta Wetlands–CUWA agreement is included in the Appendix to the Responses to Comments.

Responses to CUWA's specific comments on the 2000 REIR/EIS are provided below. See also responses to Comment Letter R11 from EBMUD regarding project effects on fisheries and levees.

R4-2. The commenter is correct in noting that the significance criteria used in the 2000 REIR/EIS analysis are identical to those used in the 1995 DEIR/EIS except that the THM criterion has been updated in response to changes in the federal Disinfection Byproducts Rule. (See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for a discussion of the new drinking water standards.)

The criteria used to determine the significance of effects of Delta Wetlands Project operations on water quality have been set to conform with the existing objectives and standards specified in the 1995 WQCP. For some Delta water quality variables, however, no regulatory objectives or numerical standards have been set. The selected significance threshold for these constituents is a percentage change from average measured values that encompasses natural variability. These significance thresholds exceed the expectations of CEQA and NEPA. See Master Response 6, "Significance Criteria Used for the Water Quality Impact Analysis", regarding the significance criteria used in the impact assessment; see response to Comment R2-3 for additional information about the significance criteria for export DOC. The following responses to comments discuss more specific objections to the significance criteria.

R4-3. The commenter seems to be confusing the analysis of simulated monthly project effects performed for the NEPA and CEQA impact assessment with the mitigation requirement that real-time monitoring occur during actual project operations and that diversions and discharges be adjusted as needed. The commenter is correct in stating that reliance on real-time monitoring to trigger adjustments to Delta Wetlands' operations would reduce the uncertainty associated with natural variability. However, in an impact analysis, it would be unreasonable to establish a significance threshold that does not allow for

project effects that fall within the natural variability of the constituents in question; doing so would make simulated effects attributed to the project indistinguishable from no-project conditions. See Master Response 6, "Significance Criteria Used for the Water Quality Impact Analysis", for a discussion of the significance criteria used in the 1995 DEIR/EIS and the 2000 REIR/EIS.

The Delta Wetlands Project WQMP includes screening criteria that allow smaller incremental changes in export water quality than the changes adopted as significance criteria in the 2000 REIR/EIS. These "Operational Screening Criteria" would be used to trigger changes in Delta Wetlands Project operations; the WQMP requires that Delta Wetlands conduct real-time monitoring to evaluate project effects against the criteria during project operations. Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", and response to Comment C9-17 describe the WQMP criteria in more detail.

R4-4. CUWA suggests that measurement and modeling uncertainty be designated as 5%, and that the significance criteria be designated as 5% of the standard or 5% of the mean value for parameters not currently regulated. There is no evidence to suggest that any change in water quality that is detectable (i.e., greater than the modeling uncertainty) constitutes a significant water quality impact. Also, changing the thresholds of significance as suggested by the commenter would not change the significance findings for most of the project effects evaluated in the NEPA and CEQA analysis. Increases in export DOC, treatment plant THMs, and salinity were already identified as significant impacts in the 2000 REIR/EIS analysis.

The significance criteria used in the EIR/EIS analysis are applied to *monthly* project operations. The Delta Wetlands Project generally would divert water for about 1 month each year and discharge for about 2 months each year. If the project were allowed a maximum monthly increase in export water quality of 20% of the applicable objective or mean value in each of these 3 months, the overall change in the annual average export water quality would be only one-fourth (i.e., 3/12) of the maximum allowed monthly change, or less than 5% of the applicable objective or mean value annually.

The Delta Wetlands Project WQMP, finalized in October 2000, uses many of the methods suggested by the commenter. The WQMP assumes a 5% uncertainty in measured or modeled TOC, THM, and bromate concentrations. The WQMP also requires that Delta Wetlands implement additional mitigation of long-term water quality impacts if project operations cause more than a 5% net increase in the TOC concentration in water diverted from the Delta for urban uses, averaged over 3 years. For more information, see Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", and the text of the WQMP, which is included in the Delta Wetlands–CUWA agreement in the Appendix to the Responses to Comments.

R4-5. As reported in Chapter 4 of the 2000 REIR/EIS (see Chapter 3C of Volume 1 of this FEIS), even without considering economic effects, the environmental impact of the Delta Wetlands Project on degradation of water quality is deemed significant, and mitigation has been proposed. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for a discussion of the relationship between economic effects and environmental effects.

R4-6. See response to Comment R2-3.

R4-7. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for a discussion of current and proposed drinking water standards and the analysis of project effects on DBPs. As noted by the commenter, plants that currently treat Delta water already must meet the 35% TOC removal requirement at times. The plants are able to employ this level of treatment, but refrain from doing so more often because of cost. Master Response 7 also discusses the issue of economic impacts on treatment plants that result from project operations. See also response to Comment R2-4 regarding CALFED's long-term goal for reducing TOC at the exports.

R4-8. The commenter argues that the 2000 REIR/EIS impact analysis did not analyze the full range of potential DOC loading rates that could occur on the reservoir islands and the corresponding increase in DBPs. The testimony and information referenced by the commenter were considered during preparation of the 2000 REIR/EIS. The testimony presented at the water right hearing in 1997 included very little data (i.e., actual measurements).

Responses to each bullet point in the comment are presented below.

Seasonal variations in DOC releases from peat soil and algae on the project islands were not ignored in the analysis. There are hypotheses about such variations; however, there are only very limited data that can be used to quantify the potential seasonal differences in loading rates for purposes of monthly impact analysis. Therefore, the analysis of potential project effects on DOC used constant monthly loading rates.

The 2000 REIR/EIS recognized that there is disagreement among experts about the amount of DOC loading to stored water that would occur under Delta Wetlands' proposed reservoir storage operations (see the section entitled "Areas of Known Controversy" on page ES-8 in the 2000 REIR/EIS [see also page S-8 of FEIS Volume 1]). Therefore, the mitigation recommended in the 1995 DEIR/EIS and 2000 REIR/EIS is designed to accommodate the uncertainty about the seasonal loading of DOC from the project islands; it consists of reducing and/or delaying project discharges to minimize effects on concentrations of export DOC. Thus, the mitigation is designed to be effective regardless of the actual increases in DOC concentrations observed under project implementation. The Delta Wetlands Project WQMP uses a similar method for mitigating project impacts on DOC. See Master

Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for more information.

See response to Comment R2-12 regarding interpretation of the SMARTS experiments.

Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", discusses the TOC removal requirements and effects of the proposed project on treatment costs. Master Response 6, "Significance Criteria Used for the Water Quality Impact Analysis", describes the significance criteria used in the CEQA and NEPA impact analysis.

The Delta Wetlands Project WQMP incorporates the criteria recommended by the commenter as an operating condition of the project. For details, see Master Response 7 and the WQMP (included in the Delta Wetlands–CUWA agreement in the Appendix to the Responses to Comments).

R4-9. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", regarding the THM prediction methods used in the 2000 REIR/EIS. The Delta Wetlands Project WQMP includes the new Malcolm Pirnie equation as a prediction tool and incorporates the criteria recommended by the commenter as an operating condition of the project; for details, see Master Response 7 and the WQMP (included in the Delta Wetlands–CUWA agreement in the Appendix to the Responses to Comments).

R4-10. The contribution of Delta Wetlands Project operations to the formation of bromate at water treatment plants can be estimated from increases in bromide attributable to the project; changes in bromide concentrations can be calculated from changes in chloride concentrations reported in the 2000 REIR/EIS. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for a discussion about evaluating project effects on bromate formation.

The Delta Wetlands Project WQMP includes many of the revisions suggested by the commenter. The WQMP identifies the Ozekin equation (with a 0.56 correction factor) as a prediction tool and includes a calculated bromate concentration of 8 Fg/l as a short-term screening criterion for Delta Wetlands operations. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", and the WQMP for details.

R4-11. See responses to Comment Letter C9, particularly Comments C9-1 and C9-17, from CCWD for more information about the assessment methods used to evaluate project effects on salinity, the effect of project operations on salinity, and the way in which implementing the FOC has reduced potential project effects on salinity.

The Delta Wetlands WQMP and the protest dismissal agreement between Delta Wetlands and CCWD incorporate some of the commenter's suggestions for operating rules to control

project effects on salinity. See response to Comment C9-17 and the Delta Wetlands–CCWD protest dismissal agreement, which is included in the Appendix to the Responses to Comments.

R4-12. See response to Comment C9-52 for a discussion of the cumulative impact analysis. See response to Comment R2-6 regarding the cumulative effects on water quality of increases in urban wastewater.

R4-13. The commenter states that the Delta Wetlands Project should also evaluate and mitigate long-term effects of project operations on water quality. The impact analyses presented in the 1995 DEIR/EIS and the 2000 REIR/EIS assumed that there would be no long-term impacts of the proposed project if the monthly impacts remain less than significant. As shown in the evaluations of project impacts on DOC presented in the 1995 DEIR/EIS and the 2000 REIR/EIS (see Chapter 3C of Volume 1 of this FEIS), salinity and DOC concentrations at the export locations under project operations may be higher or lower in any given month than concentrations under no-project conditions. These changes sometimes exceed significance thresholds, which are applied to monthly changes rather than annual or long-term averages; therefore, impacts on these variables were identified as significant and mitigation was recommended. For purposes of impact analysis, the reduction of monthly water quality impacts to a less-than-significant level is assumed to be sufficient to also reduce any long-term impacts to a less-than-significant level.

The WQMP negotiated by Delta Wetlands and CUWA includes specified monitoring, modeling, and operational controls that would protect drinking water quality as well as or better than the mitigation measures in the NEPA and CEQA analysis. The WQMP also requires that Delta Wetlands implement additional mitigation of long-term water quality impacts if project operations cause more than a 5% net increase in TOC, TDS, bromide, and chloride in water diverted from the Delta for urban uses, averaged over 3 years.

R4-14. The requirements for recirculation of a NEPA and CEQA document were described in Chapter 1 of the 2000 REIR/EIS. These requirements state, "Recirculation is not required where the new information added to the EIR merely clarifies or amplifies or makes insignificant modifications in an adequate EIR" (State CEQA Guidelines Section 15088.5). The revisions to the water quality analysis requested by the commenter merely clarify the information already presented. The impacts of the proposed project on water quality were considered significant and mitigation was recommended. The WQMP and protest dismissal agreements included in the Appendix to the Responses to Comments add specificity to the mitigation that was proposed in the NEPA and CEQA documentation already completed for the project. Therefore, the lead agencies need not recirculate the 2000 REIR/EIS.

California WATERFOWL

Conserving California's waterfowl, wetlands, and waterfowling heritage.

July 26, 2000

Mr. Jim Sutton
State Water Resources Control Board
Division of Water rights
P.O. Box 2000
Sacramento, CA 95812-2000

Mr. Mike Finan
Regulatory Branch
U.S. Army Corps of Engineers, Sacramento District
1325 J Street, Room 1480
Sacramento, CA 95814-2922

Re: Draft EIR/EIS – Delta Wetlands

Gentlemen:

The California Waterfowl Association (CWA) is pleased to submit brief comments on May 2000 Revised Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Delta Wetlands Project.

CWA, organized in 1945, is an 14,000 member conservation organization dedicated to the preservation, enhancement and restoration of California's waterfowl and wetlands. We have active programs in the areas of education, outreach, research and government affairs.

The California Waterfowl Association has been following the progress of this project for over a decade, and has been enthusiastically supportive of the project's benefits for wetland-dependent wildlife species for a very long time. Although our organization focuses on the wetland aspects of our environment, we are sensitive to the needs of fish and recognize that sometimes there are conflicts between what is good for wetland species and what is good for their neighbors in the aquatic environment. We are pleased that Delta Wetlands and the resource agencies have developed satisfactory biological opinions and that the project now is fish-friendly as well as wildlife-friendly. **R5-1**

We believe that the Revised Draft Environmental Impact Report/Environmental Impact Statement is extremely thorough and even conservative in its analysis. We

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hope that the appropriate decision-makers move quickly to approve this project so that its many fish and wildlife benefits may begin to accrue to the species of concern. **R5-1 cont'd**

Thank you for the opportunity to submit these comments.

Sincerely,

Bill Gaines, Director
Government Affairs

cc: Mike Spear
Lester Snow
Steve Ritchie
Bob Hight
Tom Hannigan
John Winther
CVHJV Management Board
Bob McLandress
Dick Daniel

California Waterfowl Association

R5-1. The lead agencies acknowledge this comment supporting the fish and wildlife benefits of the proposed project.

Letter R6

RECEIVED
JUL 31 2000

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July 27, 2000

State Water Resources Control Board
Division of Water Rights
Attn: Jim Sutton
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Sacramento, CA 95812-2000

U.S. Army Corps of Engineers, Sacramento District
Regulatory Branch
Attn: Mike Finan
1325 J Street, Room 1480
Sacramento, CA 95814-2922

Re: Revised Draft Environmental Impact Report/Environmental Impact Statement and Executive summary for the Delta Wetlands Project

Dear Ladies and Gentlemen:

The following comments are submitted on behalf of the parties represented by our firm who have appeared in the subject SWRCB proceedings. The parties have collectively sometimes been referred to as the Central Delta Parties.

Salinity

The RDEIR fails to recognize the significance of resulting increases in salinity to the Delta agricultural diverters. The RDEIR uses an artificial construct of significance and then attempts to justify it by arguing that CEQA/NEPA significance criteria is different than mitigation requirements otherwise applicable under law. (See ES-9). Significance should be related to potential adverse impact. Water quality objectives for agricultural use in the interior Delta are based on a maximum 14-day running average which except for dry year relaxations are set at .45 EC (mmhos/cm). A comparison of Table 4-11 Simulated No-Project Export with Table 4-18 Difference in Export EC Between Proposed Project and Simulated No-Project shows that particularly for the months of June and July there are numerous years when the salinity will be significantly increased. By way of example, in a year like 1995, export salinity in June would be increased from .449 EC to .497 and in July would be increased from .623 to .675. For agriculture in the interior Delta where groundwater tables are high and in effect the crops are sub- **R6-1**

irrigated, the need for artificial leaching will increase. The increases in salinity at the export pumps can be expected to be much less than those in the vicinity of the discharges from the proposed reservoirs and therefore the impact to irrigators in the vicinity of the discharge much greater. The water quality objectives have been set at specific locations based on anticipated operation of the Delta which did not include a major new source of saline water discharging into the interior channels of the Delta. The RDEIR does not adequately address the impacts due to increased salinity. Given the non-degradation policy of the SWRCB and the well recognized adverse consequences of increased salinity on agricultural, urban and industrial uses there is no valid basis to support a determination of no significance. The water quality objectives are set as maximums and any natural variability is expected to occur below such maximum levels. **R6-1 cont'd**

Temperature

The RDEIR has eliminated the temperature mitigation included in the DEIR presumably on the basis that the Amended DFG Biological Opinion incorporated more protective requirements. The Amended DFG Biological Opinion reflects a substantial reduction or retreat from the temperature requirements advocated by DFG in their direct and rebuttal testimony. (See DFG Exhibits 7 and 19). The RDEIR does not include any analysis or new evidence supporting the deletion of the DEIR mitigation. Additionally, with the reduced temperature protection it would appear that the project would not conform to the temperature requirements in the applicable Water Quality Control Plans. See particularly pages 2 and 3 of DFG Exhibit 19. **R6-2**

Levee Design and Stability and Seepage Control Measures

Attached hereto please find May 26, 2000, comments from Christopher H. Neudeck of Kjeldsen, Sinnock & Neudeck, Inc. which are incorporated herein as our comments to the levee and seepage portions of the RDEIR.

Water Supply and Operations

The RDEIR analysis ignores the economic constraints of potential purchasers of DWP water, particularly agricultural purchasers and ignores the clear testimony by urban water agencies that they would not purchase or use such water because of its poor quality. Given the clear and uncontroverted evidence in the hearing record the RDEIR should include some analysis of the marketability of the water. The assumption that all available capacity in the CVP and SWP export systems is available to the DWP is unrealistic. To the extent that DWP water is exported through SWP or CVP facilities the water rights would be junior to future uses in the areas of origin (see particularly WC 11460) and therefore the yield will substantially diminish with the passage of time. All new storage projects and re-operation of existing projects in the Sacramento-San Joaquin River Watersheds will to some extent be competing for the same "surplus" flows. The RDEIR fails to adequately consider such factors. **R6-3**

Impacts From Use of DWP Water

The RDEIR makes assumptions that the DWP water will be exported for use but fails to include any analysis of the impacts associated with such use. A range of potential impacts including particularly the potential impact to San Joaquin River Quality and San Joaquin Valley Salt Balance should be included. The impacts associated with an increase in export water salinity as well as the delivery of additional quantities of water to the west side of the San Joaquin Valley should be considered. **R6-4**

Yours very truly,

DANTE JOHN NOMELLINI

DJN:ju
Enclosures
cc: See attached mailing list

CAUA

KJELDSEN, SINNOCK & NEUDECK, INC.
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MAY 30 2000

1084-001

May 26, 2000

Mr. Dante J. Nomellini
Central Delta Water Agency
Post Office Box 1461
Stockton, CA 95201

Re: Delta Wetlands Project
Levee Stability and Seepage Analysis report by
URS Griener Woodward Clyde (URSGWC)

Dear Dan:

On behalf of the Central Delta Water Agency, Fred Brovold and I have reviewed the subject URS Griener Woodward Clyde (URSGWC) Report and submit the following comments:

The report did not assess the most severe conditions that may be encountered on this project nor did it analyze the areas with the most challenging soil conditions. A levee system is only as good as its weakest link. It is customary to evaluate the extremes and design accordingly when looking at a flood control levee. The report must address both extreme flood and seismic conditions and the areas with the most critical soil conditions and report the results accordingly. **R6-5**

The report states that the interceptor wells generally appear to mitigate seepage problems provided they are properly designed and constructed and most of all properly maintained. The cost to operate and maintain these wells will be a high cost that must be taken into account when evaluating the potential success of this project. **R6-6**

The proposed significance standards should be considered as preliminary and be subject to review and modification based on observed seepage conditions. We concur that the baseline measurement period should be longer than one year and at least three years. **R6-7**

The report provides values for wave run-up and reservoir setup but does not provide the calculated wave height values. We recommend the wave heights be calculated and the levee freeboard be evaluated. **R6-8**

We recommend performing additional sensitivity analyses for the seepage condition related to the location of the borrow pits. The borrow pit excavation will potentially remove horizontally bedded, lower hydraulic conductivity layers, and provide direct seepage paths into higher hydraulic conductivity horizontal layers. **R6-9**

The water surface elevations for the 100 - year floodplain were not considered in the levee stability analysis. It is important that the analysis address the most critical case rather than only what is considered representatively critical.

In addition to analyzing the 100-year flood plain the report should analyze the additional stage that can occur over that of the 100 flood plain which results from wind waves generated over areas with a long fetch. We have included an excerpt from a hydrology report prepared by the US Army Corps of Engineers in February of 1992, reporting the 50, 100 and 300-year flood elevations in the Delta. The purpose of the excerpt is to demonstrate that the stage frequency flood data presented in the USACOE's report are for static water conditions only, and they do not take into account wave action from wind and other sources. The attached stage data showing wind wave heights must be added to the 100-year flood plain elevation and then the levee stability analyzed accordingly. **R6-10**

The sections chosen for stability analysis on Webb Tract are not the most critical. Webb Tract's levee station 160+00 is OK, whereas levee station 630+00 is not the most critical. Sections that should be included on Webb Tract include sections between levee station 475+00 to 525+00 and levee station 410+00 to 430+00. The sections chosen for stability analysis on Bacon Island are not the most critical whereas levee station 300+00 should be included. Soil conditions and historical performance support the need for analysis of conditions at these additional sections. **R6-11**

The Factors of Safety (FOS's) for the levee waterside slopes are not acceptable. The project needs to consider its options to reduce the driving forces causing the instability on the waterside by designing setbacks and/or benching the existing waterside slopes versus the proposed impracticable waterside buttressing and/or flattening of slopes. The range of FOS's calculated for the existing condition on the waterside slope of the levee appear to be about two tenths higher than we expect from our experience in the Delta. A range of 1.3 to 1.5 is reported for the existing conditions on the waterside slope; we think a range of 1.1 to 1.3 is more typical for the waterside slope. We believe that these slightly higher FOS's result from the type of laboratory testing that was used to develop the total stress strength parameters. The report should discuss the suitability of the testing methods for the soil layers used in the stability analysis model. **R6-12**

The report should provide a more detailed description and discussion of the liquefaction evaluation. It is generally well known that the Delta area has extensive shallow deposits of potentially liquefiable Holocene sands, silty sands and sandy silts. The report should clearly show the post earthquake configuration of the critical levee section and demonstrate that an effective levee section remains after the design earthquake. The report currently estimates deformations in the range of 2-4 feet, but does not demonstrate where that deformation occurs. **R6-13**

Both of the project islands are partly bordered by rivers that have geologically old alignments and locations. Webb Tract is bordered by the San Joaquin River to the north and False River to the south; Bacon Island is bordered by Old River to the west and Middle River to the east. Extensive Holocene sand deposits are often found beneath and adjacent to these ancient

R6-13 cont'd

river locations. The report should address the potential effects of these sand deposits together with the potential for earthquake induced lateral spreading.

R6-14

The report uses effective stress strength parameters for the peat and organic soils to calculate long-term levee stability. We recommend that the report also use undrained strength analysis parameters for the peat and organic soils to calculate long term stability because the effective stress strength parameters may not account for pore pressure increases that occur during shearing which result in unconservatively higher FOS's.

R6-15

The levee break analysis should be re-done to better show the progression of a levee break. Levee breaks typically start with a fairly narrow width then eroding substantially into a much wider opening. At the narrower stages of a break there is a much greater focus of erosive energy directed on the opposite levee. Observations of past levee breaks in the Delta area show that the hydraulic erosion extends over 1,000 feet landward and 600 to 1,000 feet wide and develops scour holes down to the depths of the geologically older Pleistocene soils which may occur between depths of 40 to 80 feet deep. Riprap alone will not withstand the maximum flow rates expected from a levee failure from a full reservoir island. The report must better address the mitigation measures to avoid the impacts of this extreme erosive force

R6-16

Groundwater on the project islands varies 3-5 feet below the surface. The report indicates that borrow operations are intended to go down 9 feet. The dewatering techniques necessary to borrow to that depth have not been addressed in this report.

The report is not clear as to whether the calculated quantities for borrow are based on the neat quantities required to fill between the lines and grades of the design and the finished section or whether it includes factors for shrinkage, settlement and subsidence. It must be anticipated at a minimum, that the fill requirements for this job will be on the order of 60% to 200% + in excess of calculated neat yardage to take into account shrinkage, settlement and subsidence. We looked at one of the design sections and projected the neat fill requirements for Webb Tract based off that section. We recognize the nature of this gross estimation, nevertheless the results of that estimate was 4.0 million cubic yards, which confirms the report was based on neat yardage rather than the actual yardage required by taking into account the shrinkage, settlement and subsidence. If this gross estimate is correct then the report needs to re-evaluate its quantity requirements and take into account the required variance over the neat yardage calculation.

R6-17

The report states in the summary of slope stability analysis that the design is inadequate in meeting the criteria set forth by the USACOE and DSOD. The project must not be approved or allowed to move forward unless it is demonstrated that these design criteria can be met and a stable levee will be constructed.

R6-18

The recommended stage construction is to extend construction over 4-6-year period. This report should address the techniques and procedures which will be employed to monitor and control the filling so as to not overstress and possibly fail the levees.

The fact that the report has not addressed the most critical levee sections and the fact that the Federal and State FOS's required for this type of construction are not met requires that the project reconsider its design and resubmit for review.

If you have any question regarding the enclosed comments please call me

Sincerely,

KJELDSEN, SINNOCK & NEUDECK, INC.

Christopher H. Neudeck

Christopher H. Neudeck

CHN/ls
Encl.

OFFICE REPORT

FEBRUARY 1992

SACRAMENTO-SAN JOAQUIN DELTA
CALIFORNIA

SPECIAL STUDY

HYDROLOGY

US Army Corps
of Engineers
Sacramento District

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failures. The curves were smoothed to remove any localized effects of a levee failure.

3. The maximum elevation on a stage-frequency curve does not exceed the height of the levee crowns at that location. The curves are drawn solid up to the 100-year level. This reflects the reliability of the gaged data. Above the 100-year elevation, the stage-frequency curves are dashed. The curves are dashed above the 100-year level due to the many uncertainties that can occur at the higher frequencies. No stations have a period of record long enough to have actual data that would have a plotting position rarer than the 100-year event. Therefore, in order to estimate elevations of frequencies greater than the 100-year, the curves are extrapolated based on judgement and the shape of the curve below the 100-year. The height of the adjacent levee crown is also taken into account. The stage-frequency curves do not exceed the height of the adjacent levee crown.

C. Results - The 50- and 100-year higher-high stages at the 24 stations used in the analysis are shown in Table 6. In an attempt to determine the conditions that would cause a 100-year flood stage, or any other high flood stage, historical events were examined to establish the influence of wind, flood inflow, tidal cycle and barometric pressure on Delta stages. It was concluded that many combinations of these parameters could be possible, each with a varying degree of probability, and that predicting the factors which cause a particular high stage, or the effect of changes in one or more parameters, would be quite difficult.

When the stage-frequency data in this memorandum are used, it must be understood that:

1. For any particular frequency, the stage shown on the stage-frequency curve is valid only for that station. A stage created by any combination of high flows, tide, extreme barometric pressure, and winds could give a 100-year stage at one station and something of greater or lesser frequency at neighboring stations.

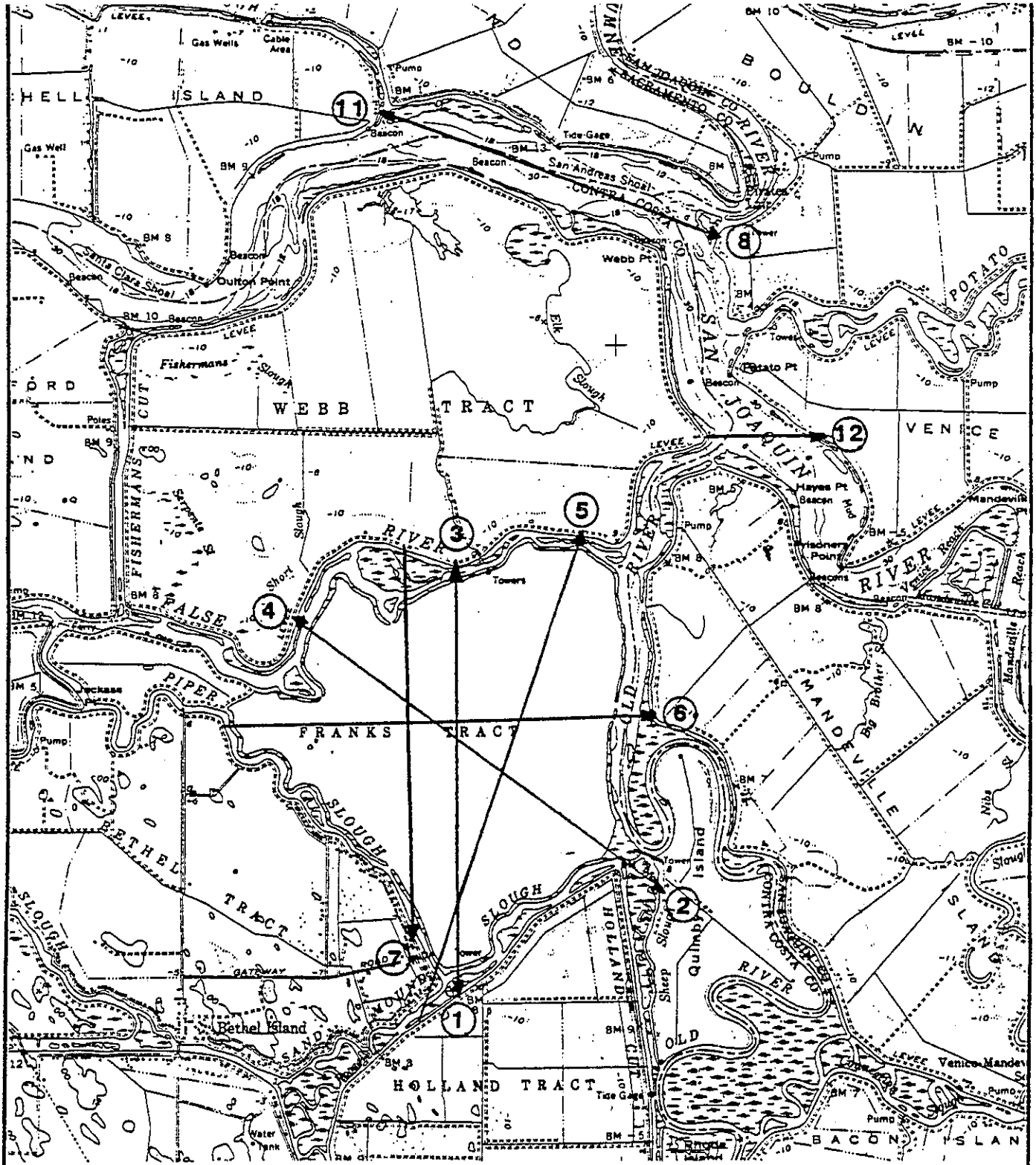
2. A maximum water-surface elevation plot developed for a particular frequency by straight-line connection of elevations from a series of stage-frequency curves will give an elevation higher, at some locations along the reach, than a historical event of corresponding frequency. This is due to the variation in width, depth and bottom slope of Delta channels. However, the error resulting from straight line elevations is less than 0.3 foot.

3. The stage data presented are for static water conditions. Wave action from wind, boats or other sources must be added to any stage data being analyzed. Wind set and any other hydrologic action that increases stages are reflected in the static stage data.

1. Sacramento River at Rio Vista - The stage recording gage for the Sacramento

TABLE 7
WIND-WAVE CALCULATIONS

Location	Levee Slope	Wind Direction	Design Windspeed (mph)	Wind Duration (min)	Design Wave (ft)	Wind Set (ft)	Wave Runup (ft)	Water Depth (ft)	Fetch Length (ft)
Holland Tract Location 1	1:2	North	35	45	2.5	.17	4.96	15	15,850
	1:3	North	35	45	2.5	.17	3.46	15	15,850
Quimby Tract Location 2	1:2	Northwest	29	51	2.1	.13	4.15	15	16,900
	1:3	Northwest	29	51	2.1	.13	2.89	15	16,900
Webb Tract Location 3	1:2	South	27	50	1.9	.10	3.70	15	15,850
	1:3	South	27	50	1.8	.10	2.56	15	15,850
Webb Tract Location 4	1:2	Southeast	35	47	2.3	.19	4.57	15	16,900
	1:3	Southeast	35	47	2.3	.19	3.30	15	16,900
Webb Tract Location 5	1:2	Southwest	23	60	1.7	.09	3.32	15	18,500
	1:3	Southwest	23	60	1.7	.09	2.30	15	18,500
Webb Tract Location 6	1:2	West	28	50	2.0	.11	3.89	15	16,150
	1:3	West	28	50	2.0	.11	2.70	15	16,150
Bethel Island Location 7	1:2	North	36	42	2.5	.17	4.90	15	14,600
	1:3	North	36	42	2.5	.17	3.41	15	14,600
Bouldin Island Location 8	1:2	Northwest	30	43	2.0	.11	3.84	15	13,500
	1:3	Northwest	30	43	2.0	.11	2.65	15	13,500
Sherman Island Location 9	1:2	Northwest	30	59	2.1	.17	4.20	15	21,350
	1:3	Northwest	30	59	2.1	.17	3.05	15	21,350
Jersey Island Location 10	1:2	West	27	76	2.1	.18	4.67	15	28,100
	1:3	West	27	76	2.1	.18	3.84	15	28,100
Twitchell Island Location 11	1:2	Southeast	36	39	2.4	.16	4.71	15	13,500
	1:3	Southeast	36	39	2.4	.16	3.26	15	13,500
Venice Island Location 12	1:2	West	29	22	1.2	.04	2.28	15	5,200
	1:3	West	29	22	1.2	.04	1.50	15	5,200



SACRAMENTO - SAN JOAQUIN DELTA

WAVE RUNUP LOCATIONS AND FETCH DIAGRAM

CORPS OF ENGINEERS. SACRAMENTO. CALIFORNIA

Prepared: J.H.
Drawn: J.H.
Date: February 1992

SHEET 1 OF 2 CHART 26

Central Delta Water Agency et al. (Nomellini, Grilli & McDaniel)

R6-1. The commenter states that the salinity evaluation in the 2000 REIR/EIS does not adequately address the impacts of increased salinity on central Delta agricultural diverters. Salinity control for agricultural purposes is recognized as an important issue for beneficial water use in the Delta. The 2000 REIR/EIS evaluated the effects of Delta Wetlands Project operations on EC at the agricultural salinity monitoring compliance stations (i.e., Jersey Point and Emmaton). These stations have well-established salinity objectives that would not be violated as a consequence of Delta Wetlands Project operations.

The greatest potential effect on central Delta salinity may occur during periods of Delta Wetlands discharge for export, when water released from the Delta Wetlands reservoir islands mixes with central Delta channel water. The commenter identifies the minimum 14-day average EC objective for the interior Delta as 450 microsiemens per centimeter (FS/cm) and states that there are months when Delta Wetlands discharges would result in an exceedance of the standard. However, because of the recognized influence of the San Joaquin River inflow, the 1995 WQCP sets southern Delta EC objectives at 700 FS/cm during the irrigation season of April–August. These water quality objectives would not be violated as a result of Delta Wetlands operations.

Additionally, the simulated EC values for water diverted onto the Delta Wetlands reservoir islands were assumed to be equal to the previous month's EC value in the south Delta channels (i.e., export EC value). This is a very conservative approach, which results in EC values simulated for the reservoirs that are higher than expected. The flow conditions that would allow Delta Wetlands to divert would also substantially reduce the salinity of the diverted water. The actual effects of Delta Wetlands operations on central Delta salinity would likely be less than indicated in Table 4-18 of the 2000 REIR/EIS (Table 3C-26 in Chapter 3C of FEIS Volume1).

The Delta Wetlands Project WQMP places additional limits on the salinity effect of Delta Wetlands operations. The chloride limit of 10 mg/l adopted in the WQMP is equivalent to about 50 FS/cm EC when the ratio of chloride to EC is about 0.2 (see Figures C1-17, C1-19, and C1-21 in Appendix C1 in the 1995 DEIR/EIS). Delta Wetlands operations would not be allowed to cause salinity to increase above 90% of any applicable standards. In combination, these criteria would provide adequate protection of central Delta salinity for agricultural beneficial uses.

R6-2. Mitigation Measure F-2 in the 1995 DEIR/EIS was recommended to reduce Impact F-2, "Increase in Temperature-Related Mortality of Juvenile Chinook Salmon", to a less-than-significant level. During the federal and California ESA consultation process, which took place after the 1995 DEIR/EIS was published, DFG, NMFS, and USFWS developed the water temperature mitigation terms that are included in the FOC. Incorporating the temperature term from the FOC into the proposed project reduces the potential temperature-related effects of the project on juvenile chinook salmon to a less-than-significant level. Therefore, no additional measures are required to mitigate project effects.

Additionally, the NMFS biological opinion for project effects on winter-run chinook salmon requires Delta Wetlands to monitor and report daily receiving water temperature and DO conditions and any changes to those conditions that result from Delta Wetlands discharges. NMFS will use the information to determine whether the Delta Wetlands Project is affecting winter-run chinook salmon, spring-run chinook salmon, and steelhead to an extent not previously considered.

The SWRCB will determine appropriate temperature requirements.

R6-3. An economic analysis of the marketability of Delta Wetlands Project water is not necessary for the full disclosure of environmental impacts and is not required by CEQA or NEPA. It would be improper to speculate on the potential effect that Water Code Section 11460 et seq. may have on water availability with the passage of time. The assumptions used in the analysis present a "worst-case" scenario and therefore are appropriate for purposes of NEPA and CEQA compliance.

R6-4. See Master Response 3, "Areas of End Use and Potential Growth-Inducement Effects of Delta Wetlands Water Deliveries".

R6-5. See Master Response 8, "Levee Stability Analysis and Worst-Case Conditions".

R6-6. There is no requirement that the NEPA and CEQA analysis examine the costs associated with operation of the interceptor well system; Delta Wetlands would be responsible for funding all terms and conditions and mitigation measures adopted as part of any permits issued by USACE and the SWRCB.

R6-7. See response to Comment C17-4 regarding modifications to the proposed seepage performance standards. See response to Comment R10-16 regarding the period for baseline groundwater measurement.

R6-8. The analyses of wave height presented in Appendix H of the 2000 REIR/EIS included an estimate of wave height, reservoir setup, and wave runup characteristics based on design wind velocities and reservoir fetch and levee geometry.

Design wind velocity data were obtained from the generalized wind charts of "fastest mile of record" published by USACE (U.S. Army Corps of Engineers 1976). These data indicate that the estimated fastest-mile-of-record wind velocities over land at elevation 25 feet for winter, spring, summer, and fall are 58, 52, 40, and 60 miles per hour, respectively. The fastest-mile-of-record wind velocities were adjusted for duration-dependent average wind velocities using the procedures described in USACE's Shore Protection Manual (U.S. Army Corps of Engineers 1984). For example, the 40-minute-duration average wind velocities were estimated to be 47, 43, 34, and 49 miles per hour during winter, spring, summer, and fall, respectively. The estimated wave characteristics for the most severe wind conditions during fall are summarized in the following table.

Reservoir Name	Fetch Length (miles)	Wave Height (feet)	Reservoir Setup (feet)	Wave Runup Without Riprap (feet)	Wave Runup With Riprap[1] (feet)
Bacon Island	3.15	4.7	0.38	4.0 (5H:1V) 6.4 (3H:1V)	2.2 (5H:1V) 3.5 (3H:1V)
Webb Tract	2.83	4.4	0.34	3.8 (5H:1V) 6.1 (3H:1V)	2.1 (5H:1V) 3.4 (3H:1V)

[1] If riprap is used on the bank slopes, the runup would be reduced to 55% of the estimated runup values.

The values presented above would be considered when determining appropriate freeboard during final design. As described in the 1995 DEIR/EIS and 2000 REIR/EIS (see Chapter 3D of Volume 1 of this FEIS), Delta Wetlands would construct levees to meet or exceed DWR's Bulletin 192-82 standards, which require a freeboard of 1.5 feet above 300-year flood stage in the adjacent channel. The preliminary design for the Delta Wetlands reservoir islands shows levees built to approximately +9 feet elevation, resulting in a 3-foot freeboard on the interior of the islands under maximum reservoir storage conditions. Based on the analysis presented above, Delta Wetlands may construct a levee that would have a gentler interior slope (i.e., 5H:1V) and would be reinforced with riprap for erosion protection in areas subject to long fetch and high wave action. The proposed interior 3-foot freeboard on a riprapped 5:1 slope would be adequate to prevent overtopping from wave runup and reservoir setup even under the most severe wind conditions.

R6-9. Appendix H of the 2000 REIR/EIS presents an analysis of the effects that excavating borrow pits would have on seepage. The analysis modeled the borrow pit as exposing the sand aquifer. A sensitivity analysis was completed by analyzing the effects of a borrow pit at a range of distances from the levee. This method was used to estimate the minimum distance to the levee beyond which no change in the rate of seepage to neighboring islands was observed. No additional sensitivity analysis is needed.

In the sensitivity analysis described in Appendix H of the 2000 REIR/EIS, no change to seepage conditions was observed when the borrow pit was simulated at 400 feet from the levee. Because of uncertainties about the exact shape of the aquifer body in the subsurface and the exact rate at which it transmits groundwater, an 800-foot setback distance between the borrow pit and the project levees was recommended. This is a conservative approach. A setback distance greater than about 800 feet from the levee toe should ensure that there is no noticeable effect on seepage in the channel and on neighboring islands.

R6-10. The water surface elevations for the 100-year flood stage were taken into consideration during the levee analysis. The 100-year flood stage in Delta channels adjacent to the reservoir islands was estimated to be approximately elevation 7.2 feet. However, the purpose of the levee stability analysis is to provide a reasonably conservative analysis of conditions that would affect levee stability. Typically, the flood stage condition of 7.2 feet is a short-term condition. Gage recordings and historical data confirm that the maximum

peak flood occurs for a short period of time (i.e., hours). The 7.2-foot flood stage condition does not last long enough to establish the subsurface conditions that affect levee stability in the long term. Thus, the 7.2-foot flood stage condition does not represent the steady-state condition. The flood-stage level of 6.0 feet was used instead in the levee stability analyses to avoid excessive cumulative conservatism.

The flood-stage elevation and wind-generated wave conditions described by the commenter contribute to the design of an appropriate channel-side freeboard to prevent overtopping during storm events. Because these factors are of short duration and do not affect the long-term condition of levee stability, they need not be factored into the levee stability analysis.

R6-11. See Master Response 8, "Levee Stability Analysis and Worst-Case Conditions".

R6-12. The mitigation measure on page 6-21 in Chapter 6 of the 2000 REIR/EIS (page 3D-40 in Chapter 3D of FEIS Volume 1) requires that Delta Wetlands adopt a final levee design that achieves a recommended FS of 1.3 and reduces the risk of levee failure on the water-side slopes. The measure does not limit the options available to Delta Wetlands during final design to meet the recommended FS. Appendix H of the 2000 REIR/EIS recommends buttressing of water-side slopes or flattening of land-side slopes as practical options to achieve the recommended FS; additional options were presented at the water right hearing in October 2000. As shown in Figure R6-1 which follows this response, these options include:

- reducing the channel-side slope;
- constructing a rock buttress in the channel at the levee toe;
- widening the levee crest so that even if a portion of the levee should fail and slump off, the remaining crest will be wide enough to provide a capable levee until repairs can be made; and
- widening the levee crest with "notching" of the levee on the channel side (i.e., lowering the channel side of the levee crest to reduce the weight supported by the lower channel-side slope), thereby reducing the diving forces for channel-side failure.

The commenter questions the accuracy of the calculated range of FSs for existing conditions. The FSs for existing conditions on the water-side slope were calculated based on the geometry and soil conditions of the cross sections used in the analysis, which were selected to be representative of typical conditions for the reservoir islands. See Master Response 8, "Levee Stability Analysis and Worst-Case Conditions".

Soil shear strength parameters used in the levee stability analyses were derived from a combination of sources. These include:

strength tests on soils in the area by HLA;

published correlations between the index properties of soils (e.g., water content, density, grain size, plasticity), their resistance to penetration by drilling, and their shear strength; and

published and unpublished results of various laboratory tests.

Shear strength parameters for sandy soils were based on a combination of published experimental data on the relationship between shear strength and penetration resistance (based on field measurements), professional judgment, and experience with similar materials.

Shear strength parameters for peat were estimated using:

the results of HLA's strength tests on peat in the area;

published data on similar materials; and

unpublished research data from the University of California, Davis.

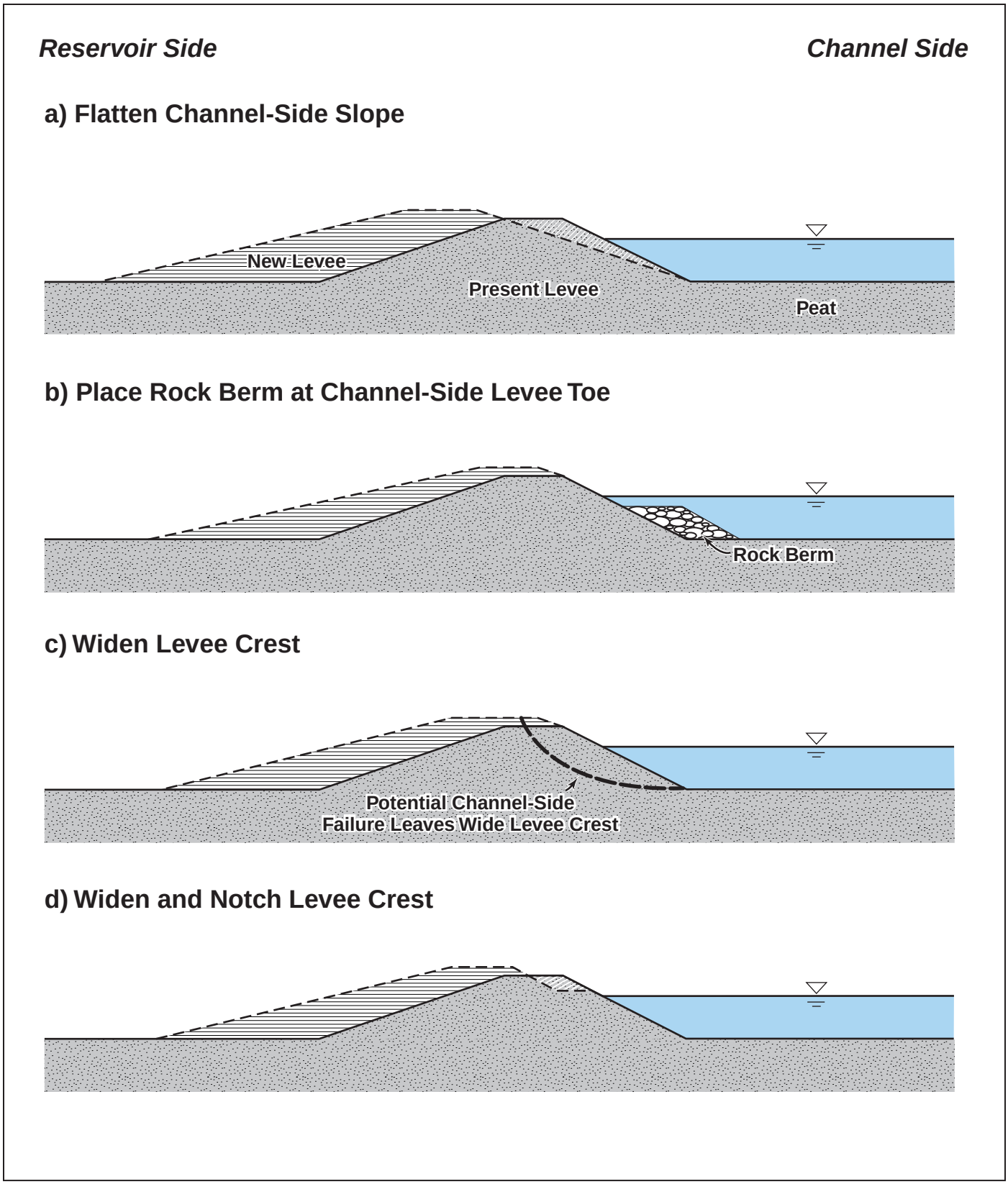
R6-13. See responses to Comments R2-25, R2-26, and R2-27 regarding the seismic stability analysis and potential for liquefaction.

R6-14. Undrained strengths were used to assess the FS for the "end-of-construction" condition, which represents the condition of the levee immediately after improvements have been constructed in a single stage. The end-of-construction analyses assumed single-stage construction for two reasons:

Single-stage construction is a potential worst-case condition.

Using this assumption was a conservative way of modeling the conditions that would result from multiple-stage construction if there were too little time between stages for the soil to gain an appreciable amount of strength.

Undrained strength will increase as the compressible materials, including the peat foundation materials, consolidate. Consolidation of these foundation materials, which are weak initially, results in considerably higher FSs than those reported for the end-of-construction condition. The analyses showed that complete consolidation under staged construction would likely occur in approximately 1 year. Once the compressible materials completely consolidate, FSs are typically assessed using drained strengths. Therefore, the analyses of long-term conditions presented in the 2000 REIR/EIS used drained strengths. This method is consistent with generally accepted engineering practice.



Jones & Stokes

Figure R6-1
Methods to Improve Channel-Side Stability

R6-15. The levee breach analysis presented in Appendix H of the 2000 REIR/EIS shows a range of levee break widths that represent the progression of a levee break. The analysis simulated the effects on Bradford Island of the breach of a Webb Tract levee. The area between Bradford Island and Webb Tract represents one of the shortest distances between a reservoir island and a neighboring island; therefore, this analysis represents a worst-case scenario. The analysis evaluated the potential effects of a levee breach under full reservoir conditions (+6 feet elevation) and extreme low channel condition (-2 feet elevation), which also represents a worst-case scenario. Appendix H presents results for levee breaks 40, 80, 200, and 400 feet wide, with the maximum resulting flow velocities along the channel bank opposite the breach shown as 2, 9, 12, and 16 fps. A maximum breach opening of 400 feet was selected for these analyses based on the report Breaching Characteristics of Dam Failures (MacDonald and Langridge-Monopolis 1984). Results of the analyses are summarized in the following tabulation.

Breach Width (feet)	Breach Development Time (minutes)	Peak Outflow (cfs)	Maximum Water Surface Elevation in Slough (feet)	Maximum Flow Velocity in Slough at Opposite Bank (fps)
40	24	9,200	- 1.75	2.5
80	30	24,000	- 0.75	8.0
200	42	61,000	+ 0.75	12
400	57	123,000	+ 5.5	16

The observed erosive forces referenced by the commenter refer to levee breaches in which water from an adjacent channel enters a "dry" Delta island. The head differential between a full or flood-stage channel (assuming +6 feet elevation) and a dry or empty island in the central Delta (lower than -10 feet elevation) is greater than in the with-project case. Additionally, in the unlikely case that a levee breached under the with-project condition, water from a reservoir island would be expelled into the channel water rather than into a dry island; the resulting force would be less erosive than when water from a channel enters a dry island.

As discussed in Master Response 8, "Levee Stability Analysis and Worst-Case Conditions", CEQA states that an EIR should discuss the effects on the environment with "emphasis in proportion to their severity and probability of occurrence". (State CEQA Guidelines Section 15143.) As described in the 2000 REIR/EIS, the potential risk of a levee failure on the project islands is extremely low. Additionally, the 2000 REIR/EIS includes mitigation to ensure that the Delta Wetlands levees meet minimum stability requirements; this further reduces the risk of levee failure under project operations. Therefore, no additional analysis or mitigation is required.

R6-16. Borrow site dewatering will not be required to extract the material used in levee improvements. Once the material has been removed from the borrow area, it can dry at other locations within the island before being placed on the levees.

As stated on page 3-16 of Appendix H of the 2000 REIR/EIS, "These estimates [of borrow material quantities] include not only the initial fill quantity but also the additional quantities required later to restore and continue restoring the levees to the specified configuration to compensate for long-term settlement".

R6-17. If water is stored above +4 feet elevation on the reservoir islands, Delta Wetlands will need to propose final levee designs that meet the DSOD design criteria. Additionally, the 2000 REIR/EIS includes a mitigation measure that requires Delta Wetlands to adopt a final levee design that achieves a recommended minimum FS of 1.3, which is consistent with DWR's recommendations under Bulletin 192-82 for rehabilitation of nonproject levees in the Delta. This standard is more conservative than USACE's standard for nonfederal Delta levees of 1.25.

R6-18. Construction monitoring should track:

pore pressures in foundation soils (particularly in weak foundation soils), which reflect consolidation and strength gain; and

displacements, which are indicative of potentially impending failure.

Rigorous monitoring allows the rate of fill placement to be adjusted in such a way that the potential for slope failure is minimized. The following description of construction monitoring was presented by Delta Wetlands at the October 2000 water right hearing (Exhibit DW-95).

> [C]onstruction monitoring allows the designer to check that the intent of the final design is properly incorporated into the constructed works. Where conditions may vary from those shown on project plans and final design documents, the levees can be modified to ensure that a safe and reliable levee is maintained during and after construction.
>
> [During construction, Delta Wetlands' resident engineer] will check that the soil conditions encountered during construction are consistent with the conditions used as the basis of design and check that the contractor is constructing the improvements according to the project plans. [The resident engineer] will observe and provide appropriate testing for fills placed for the levees, erosion protection systems, cutoff walls, monitoring wells on adjacent islands, interceptor wells, and borrow areas. Engineering technicians will monitor fill placement and check the relative compaction of fills. [Data will be collected] from instrumentation placed within fill and monitoring wells. During installation of interceptor wells, [Delta Wetlands] will e-log the bores and check gradations of sand from the drill cuttings to [refine the final designs for] screened interval(s), slot size(s), and filter pack gradation. Engineers will provide oversight for the various construction elements, attend meetings,

> provide input for the contractors, respond to submittals, and write letters and reports regarding construction activities.
>
> The construction monitoring will include checking that the fill placement is not overstressing the levee and peat foundation. The levees will be monitored during filling operations to check for signs of distress such as cracking or slumping. In addition to the visual observation, [Delta Wetlands will monitor] the rate of pore pressure dissipation and strength gain in the peat soil. This information will provide a check on the results of the stability analyses. If the pore pressure measurements and other monitoring indicate that the peat is not gaining strength as rapidly as anticipated, the construction sequence [would] be modified.

Additionally, the protest dismissal agreement between Delta Wetlands and EBMUD establishes a Design Review Board. The duties of the Design Review Board include reviewing plans and specifications for levee designs, reviewing construction monitoring results, and confirming that the project design and implementation meets the design objectives.

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Phone:

Contra
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County

Dennis M. Barry, AICP
Community Development Director

Letter R7

State Water Resources Control Board
Division of Water Rights
Attn: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

July 26, 2000

Dear Mr. Sutton:

Thank you for the opportunity to comment on the revised draft Environmental Impact Report/Statement for the Delta Wetlands Project. We are in receipt of the revised draft, and have reviewed the subject areas contained in the document for which additional information has been developed.

The County has submitted a number of questions regarding the Delta Wetlands Project at the time the draft Environmental Impact Report/Statements were circulated, in 1990 and again in 1995. Some subject areas have been addressed as part of the additional information provided in the recently revised draft, but a great number of comments made during earlier years remain unanswered. We assume prior comments will be addressed as part of the final document. **R7-1**

The information provided in the revised draft document does not fully address the questions raised by the County in our letter to the State Water Resources Control Board dated July 22, 1997 (attached), regarding the Water Rights Decision for the Project. Therefore the County submits the comments contained in the attached letter to you at this time, to ensure response as part of the final environmental document.

If you have questions, please do not hesitate to contact me at (925) 335-1226.

Sincerely,

Roberta Goulart

Roberta Goulart
Principal Planner

Office Hours Monday - Friday: 8:00 a.m. - 5:00 p.m.
Office is closed the 1st, 3rd & 5th Fridays of each month

The Board of Supervisors
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Donna Gerber, 3rd District
Mark DeSaulnier, 4th District
Joe Canciamilla, 5th District

Contra Costa County

Phil Batchelor
Clerk of the Board
and
County Administrator
(510) 335-1900

Tble SH III-45

July 22, 1997

Mr. Walt Pettit, Executive Director
State Water Resources Control Board
Paul R. Bonderson Building
901 P Street
Sacramento, CA 95814

Re: Water Rights Decision on the Delta Wetlands Project

Dear Mr. Pettit:

The Contra Costa County Board of Supervisors has authorized this letter to urge that any decision to grant water rights to the Delta Wetlands Project ensure that the drinking water supply of County residents is fully protected and that the fish and other aquatic resources of the Delta are maintained. Current plans for operating the Delta Wetlands Project provide no such assurance. Potential negative impacts include the following:

- Delta Wetlands diversions could aggravate the salinity intrusion problem in the Delta at some times of the year, degrading drinking water quality for hundreds of thousands of County residents and harming fish.
- The X2 salinity requirement for the Delta Wetlands Project under the federal biological opinion is less restrictive than the salinity requirement for the Los Vaqueros Reservoir diversions, even though the Los Vaqueros water right would be more senior. As a result, operation of the Delta Wetlands Project could limit or even prevent diversions to Los Vaqueros at times when such diversions would otherwise be allowed. R7-2
- Releases of water from the Delta Wetlands Project could harm water quality for municipal drinking water and fish by leaching excess amounts of organic carbons from the peat soils, by concentrating salts via evaporation, and by increasing water temperatures.
- The timing of Delta Wetlands operations could create problems by diverting water during periods of low water quality and releasing this stored water when water quality in the Delta is relatively better.

The State Water Resources Control Board should address these negative impacts by including protections for drinking water and fish in any water rights permit that is issued for this project.

Specifically, the County recommends that any permit be linked to: 1) an X2 requirement for diversions that is more stringent than that for the Los Vaqueros Project; 2) a prohibition on Delta Wetlands discharges when water quality in the project is lower than that in the Delta; and 3) a general condition that the Delta Wetlands Project will not harm Contra Costa Water District or any other water diverter in the County with more senior water rights. **R7-2 cont'd**

Thank you for accepting the comments of Contra Costa County on this issue. If you have any questions about this letter, please feel free to call John Kopchik at (510) 335-1227.

Sincerely,

Mark DeSaulnier
Chair, Contra Costa County Board of Supervisors
Ex-officio Chair, Contra Costa County Water Agency

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Harvey E. Bragdon
Director of Community Development

INFORMATION COPY

December 21, 1995

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

INFORMATION COPY

Dear Mr. Sutton,

Thank you for the opportunity to review the Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project. Generally, the report is exhaustingly thorough. There are, however, a range of issues which are of concern to the County and to which we need responses.

First, as a statement, we recognize that NEPA requires consideration of a range of alternatives to be discussed throughout the EIR/EIS. However, the Habitat Management Plan (HMP) in the appendices and the thrust of the body of the EIR all imply that Alternative 3 is not really viable in terms of mitigation of project impacts. We could spend considerable effort commenting on that alternative but have chosen not to, given our belief that for that alternative to be chosen additional environmental review would be required. It does not provide mitigations for on-site habitat issues. No off-site solutions are proposed. Given County, State and Federal regulations and policies, the document would need substantial augmentation and recirculation for the selection of Alternative 3. We feel Alternative 1 and 2 effectively cover the worst case scenarios to be considered. R7-3

Second, it would be impossible for the reader not to be aware of the amount of effort and creativity put forth in the development of the proposal. The amount of technical work necessary to analyze this complex project, and the cooperation of the applicant and State and Federal Agencies to bring the document to this point in the process, is obvious. Staff and consultants should be commended for their efforts to date.

Now to specifics on the Draft document. Page 3D-5 discusses the Delta Flood Protection Act of 1988. It indicates in the second paragraph that it authorized $12 million annually through 1998-1999. Should that read 1988-1999? At the end of this

paragraph it states "under the Delta Flood Protection Act, no project receiving funding from the act can result in a net long-term loss of riparian, fishery, or wildlife habitat, and a DFG finding to that effect must be issued before funds are disbursed." Have any of the four islands in this application received funds under this act? What assurances have been given to DFG and how does this project effect those assurances?

The role of Local Reclamation Districts is discussed on page 3D-6. If the project is approved as applied for, 3 of the 4 islands will be wholly owned by Delta Wetlands. The project description implies that Delta Wetlands will be responsible for levee repair and maintenance (as does the HMP in the Appendices). What will be the role of the Reclamation Districts relative to the project? Will the 3 wholly owned islands be maintained by Delta Wetlands and the Reclamation Districts be obsolete and be abolished? There may be some merit for abolition of these districts if the islands are wholly owned by a private corporation. The discussion on Financing the Levee System on page 3D-19 is not clear in this regard. That section states that "the cost of reclamation would be much lower than in the use of existing Delta levees because <u>much</u> (emphasized) of the routine maintenance would not fall within State and Federal cost-sharing programs". Specifically, what State and Federal funds are still proposed to be utilized for maintenance? Given the economic analysis found in the EIR, why should any State or Federal funds continue to be needed for levee maintenance and repair? Shouldn't all obligations be transferred to Delta Wetlands except for Holland Tract, (which they won't wholly control)? Since this is listed as a beneficial impact, the final document should clarify any government levee maintenance subsidy that would still accrue to the project. In case of a levee failure, will State and Federal funding (subsidy) be allowed? **R7-3 cont'd**

Page 3E-2 under Webb Tract references the Delta Ferry Authority. It indicates that this authority is jointly funded by Contra Costa County, the Webb Tract Reclamation District and the Bradford Island Reclamation District. That was an interim financial arrangement. The County is no longer funding the ferry services. The County still collects local funds through a County service area for this service; about $15,000/year. It is transferred to the ferry operator. The impact of this project on the existing ferry service is discussed on page 3E-6 and that anticipates a decline in usage. If that's true, then the project raises the issue of the viability of the continuance of the ferry service. Delta Wetlands may need to subsidize the service to keep it viable. Without the ferry service, the recreational facilities on Webb Tract would probably be infeasible. Having Delta Wetlands subsidize the ferry service should be made a mitigation measure for the project. Impact E-2 needs to be revisited to assure additional ferry operational funding.

The discussion on page 3E-2 indicates that the County in 1993 "abandoned those sections of Holland Tract Road on the west and east perimeter levees past the locked gates". That was done in response to a request of the reclamation district for these vacations. The last time staff visited the perimeter roads on the west and east levees, they were not passable to passenger vehicles, however, trucks and four wheel drive vehicles could utilize those roads. If the recreational facilities are to be approved by the County, improved road access to all the recreation facilities will be required. The roadways will be private driveways and will need to be maintained by either the reclamation district or the owner of the recreation facilities. This should be made a mitigation measure in the Final EIR.

Mitigation Measure E-4 on page 3E-11, dealing with private security services, is essential if the recreation component is to be developed.

The discussion of providing fire district services to the recreation facilities on Webb Tract is casually mentioned in Mitigation Measure E-5 on page 3E-11. While procedurally, this mitigation measure is correct, there may be impacts associated with placing this island into a fire district. The Bethel Island Fire Protection District is the nearest district; and it is largely a volunteer fire protection district. Such a district relies on local residents to serve as volunteers and to man the fire equipment. The project description does not indicate if there will be caretakers and/or permanent staff associated with recreational facilities. It does not indicate if Delta Wetlands employees will be largely day workers or if 24 hour a day coverage will be provided. Such employees could form the basis of a volunteer district staff. **R7-3 cont'd**

Unfortunately, the response time for fire equipment and manpower to arrive by boat from Bethel Island would be long. On island fire fighting capability would be desirable should the recreation facilities proceed. Mitigation Measure E-6 should be strengthened to require local fire fighting capability to serve the proposed recreational facilities (rather than just annexation to a district). Districts, per se, don't fight fires, manpower and equipment does. The island roads will need to be improved to handle fire equipment.

The discussion of water, sewage and solid waste facilities to serve the recreational facilities is very generalized and merely indicates the need to meet County requirements. The Mitigation Measures E-7, E-10 and E-12 just require obtaining appropriate local and state permits for recreational facility services and utilities. This lack of specificity may require supplemental environmental analysis.

On page 3F-15 Mitigation Measure F-1 requires providing information to USFWS and DFG on fish habitat. The information called for would be helpful to the Counties in consideration of the permits for location of the recreational facilities. A sentence should be added to this mitigation measure which requires this material to be submitted to the Counties when considering the recreational facilities and urging coordination of that review with USFWS and DFG.

On page 3I-12 under Webb Tract, it indicates "the clubhouse on the eastern tip of the island is sited above the proposed high water level and could remain onsite". Could this be converted to one of the proposed recreation facilities by Delta Wetlands or are they asking for the other new facilities plus this existing one? The project description Figure 2.3 does not show this existing clubhouse. If it is to remain, does this change the project description? Are there added impacts, e.g., traffic, if it continues to exist?

On page 3I-12, there is a discussion of the Williamson Act Contract on Webb Tract and that County staff has determined the water component to be consistent with the current Williamson Act. While that is correct, it would be desirable for the applicant to notify the County of his intent to non-renew this contract and the issue of Williamson Act status will resolve itself over time. **R7-3 cont'd**

On page 3I-12, it discusses Contra Costa County staff's view that for the proposed level of recreation facilities will require rezoning to Planned Unit District. The same discussion takes place on page 3I-13 dealing with Holland Tract. If these areas aren't to be rezoned then land use permits will be required. Unfortunately Table 4-1 in Chapter 4 Permit and Environmental Review and Consultation Requirements, fails to list either rezoning or land use permits. Those concepts should be added to Table 4-1. Health Department permits for water and sewage issues should also be added to that table, consistent with prior EIR text.

Page 3I-2 correctly indicates that the Contra Costa County General Plan contains policies which urge the preservation of prime agricultural soils. The County General Plan defines prime agricultural soils as Class I and II soils; it does not utilize the NRCS system. Holland Island and Webb Tract are almost exclusively Class III and IV soils. Consequently, the discussion on page 3I-14 on the conflict with our prime agricultural soils policies in the County General Plan misses the mark.

Page 3I-6 under Holland Tract, states that Veale Tract is within the Urban Limit Line (ULL) and so development is likely to occur within the next 20 years. This statement

is incorrect. - Being inside the ULL would allow consideration of a general plan amendment from agricultural to urban use, not a presumption that such change could occur.

Page 3L-11 discusses barge traffic to import rock to the project sites for levee stabilization. No source(s) of rock is identified. Importing rock will affect truck trips. No loading points for the barges are identified. Truck trips will affect road capacity. More importantly, if they travel on rural delta roads they could cause substantial impacts to the structural integrity of these roads. The Final EIR needs to identify the probability of truck traffic on specific roads for rock and other construction materials. This discussion needs to be coordinated with the Public Works Departments of the affected counties. Adequate mitigation needs to be suggested in the Final EIR; that could include resurfacing or roads to withstand the wear and tear of the truck traffic.

On more general issues, there is a recommendation in the DEIR for a $2/acre foot Fishery Enhancement Fund. Will the use of this money be restricted to studies and programs for the Bay Delta System? They should be. Could the mitigation measure be modified to insure notification of the Contra Costa County Water Agency when meetings are held to discuss use of these funds? The use of these funds should be restricted to Bay Delta projects and not be used to cover staff operational costs. A mitigation measure should provide for such limitations. **R7-3 cont'd**

Proposed Delta Wetlands project operations could result in lower water quality in some instances, impacting Contra Costa Water District drinking water intakes at Rock Slough and Old River. In particular, it is not clear how project operations could affect CCWD's ability to fill the Los Vaqueror Reservoir. How will project operations affect the ability to fill the Los Vaqueror Reservoir with higher quality water?

It is not clear how Delta Wetland reservoir filling could occur during below normal and dry water years. What are the effects of reduced reservoir filling versus a full reservoir scenario? If no filling occurs in the absence of surplus flows, how will the reservoir islands be managed?

Despite the significant degree of evaluation contained throughout Chapter 3 of the draft EIR/EIS and appendices, questions and concerns remain relative to water quality impacts, given the wide range of conditions found over time in a very complex and little-understood Delta system. In addition, the effects on fish due to reduction of outflow and resultant change in flow patterns remains unclear. Models, although helpful in

gauging general change, do not provide a great degree of certainty, given the wide range of varying, complex conditions found in the Delta. For these reasons, Contra Costa County requests that a detailed, ongoing monitoring program be instituted to allow continued specified assessment of these important issues and their impacts, should this project be implemented. This could have an added benefit in continued assessment as to this project's potential for impacts relative to other water rights, (determined not to be significant, as described on page 3A-11).

The DEIR does not discuss the greenhouse effect and its potential impacts on this project. While the impacts of the concept are sharply debated, the concept that there is something climatically going on that seems to be scientifically defensible. This could effect levee height requirements, etc. Some discussion of this problem would appear mandatory.

No site specifics are presently included on the proposed recreational facilities. The document did not include any information on if the hunting facilities as proposed, are marketable. Nor did it describe the organization structure. Will they be for individual clubs or will Delta Wetlands manage them as a unit? While a schematic is included in an appendix on what a typical recreation facility design might look like, no interior design or elevations are provided. The exact location of the facilities are not identified. The road improvements necessary to serve the facilities will need to be identified. All these items will be needed by the counties for consideration of the recreational facilities. If Delta Wetlands intends to permit these over time and not all at once (or build them over time), follow-up environmental documentation may be needed. The Final EIR should set the stage for subsequent environmental documents. **R7-3 cont'd**

As is clear from the prior comments, most of our concerns focus on the proposed recreational facilities for which the County will be a permitting agency. The Final EIR will be adequate to consider the larger issues behind the Delta Wetlands project. It may, however, need to be supplemented for County consideration of the recreation facilities.

The EIR/EIS does not appear to discuss inclusion of public access onto these islands. The recreation component should include some public access points, and these areas should be included in environmental review of the project.

As a last comment, the Habitat Management Plan (Appendix C-3) appears to be complete and workable. The hunting component, however, will be dependant on the ability to approve the recreation facilities. That won't be known until after the lead

State and Federal Agencies make determinations on the water storage concepts.

If you have any questions on these comments, feel free to call Jim Cutler at (510) 646-2034 or Roberta Goulart at (510) 646-2071.

R7-3 cont'd

Sincerely yours,

Roberta Goulart for

Jim Cutler
Assistant Director,
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Contra
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Harvey E. Bragdon
Director of Community Development

JCC ✓

(18)

April 30, 1991

State Water Resources Control Board
Division of Water Rights
901 P Street
Sacramento, CA 95816

RE: DELTA WETLANDS DRAFT ENVIRONMENTAL IMPACT REPORT

In addition to comments previously submitted, Contra Costa County offers the following comments pertaining to the Delta Wetlands draft environmental impact report.

1. Potential impacts of this project, DWR's North and South Delta Water Management Plans, the Los Baños Grandes Reservoir and the Los Vaqueros project have serious cumulative implications to the water quality, fisheries, supply and export scenarios, and need to be examined in greater detail.

   The fact that the proposed Delta Wetlands Project operations would result in decreased outflows during part of the year, is a cause for concern, especially during the dry water year. We understand that no reservoir filling would take place during the critically dry year. What are the impacts of decreased outflow resulting from this project, coupled with the DWR's Delta Water Management Plans, and the Los Vaqueros Reservoir when this project becomes operational? What are the impacts to fish and wildlife resources during the dry water year, on a cumulative basis?

   Also, by making additional water available during the summer months for exportation, the Delta Wetlands Project may allow changes in operation of the State and Federal projects which could increase impacts to fishery resources and water quality. For these reasons it is important to include detailed cumulative impact assessments as part of the environmental review process. R7-4

2. The possibility of a reduced reservoir filling scenario should be included for at least the dry water year and below normal year, and considered for the normal water year as part of the environmental review process. Minimum flow standards should be set prior to pumping operations, and a reduced period of reservoir filling should be established as part of this project in dry and below normal water years.

3. Longstanding County policy dictates that no additional exports should occur until the current Bay-Delta proceedings are completed, and new water quality standards have been set. Some discussion of effects of revised standards on the project should be

included in the EIR/EIS, as new standards could significantly revise the extent or degree of impacts described.

In addition, the impact of increased exports needs to be examined in greater detail. How would these exports dovetail with SWP and CVP operations?

4. The EIR/EIS discusses various components of water quality as regards the proposed project operations. The EIR/EIS states that an increase in compounds with trihalomethane formation potential would result from water storage operations. How would this affect the Contra Costa Water District intake at Rock Slough, especially from discharges at Holland Tract?

The EIR/EIS states (p 3C-112) that island discharges and their effects will be evaluated. The effects of discharges, (both direct and indirect) need to be evaluated as part of the EIR/EIS to the extent possible. In addition, a mitigation/monitoring plan should be included to deal with impacts which could occur.

5. The EIR/EIS should address an alternative whereby less than four islands are flooded. Given the many complex issues associated with the proposed project, flooding of one (or two) islands could take place initially, in order to assess impacts and target problem areas on a smaller scale. We understand that the four islands each have characteristics which make them unique. However, there is much information (such as impacts to water quality, circulation, discharges, fisheries, wildlife, levee stability and seepage) which could further refine and compliment existing data as well as mitigation/monitoring programs, which also need to be included. R7-4 cont'd

6. A comprehensive seepage control program (which includes monitoring, mitigation and bond) should be finalized and included as part of the EIR/EIS process. We understand that due to interior grading of islands, some potential exists for movement of water through sand lenses to adjacent islands. We also understand that much work has been done on this issue, and would like to see this reflected in the report.

In addition, a program for levee stability and maintenance needs to be identified, which also includes a monitoring/mitigation/bond program. The EIR/EIS states that levees would not be constructed prior to flooding of the islands. Erosion of proposed 10:1 slopes will require maintenance. Responsibility needs to be outlined in the event of levee failure.

Funding for levee rehabilitation as part of the Delta Wetlands Project should not come from sources designated through SB 34, the Delta Flood Protection Act. The nature of the project, coupled with the tremendous levee restructuring required, make this project an unfavorable candidate for use of public funds. The EIR/EIS should discuss this issue.

7. The EIR/EIS states that no public access will be allowed on the islands, except for the possibility of pre-arranged tours. We feel some public access points should be included

as part of this project. The County may require some type of public access as part of the permit process, therefore we recommend that it be included as part of the EIR/EIS.

8. The Delta smelt is a candidate for listing as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) or the California Department of Fish and Game (CDFG). The Delta Wetlands Project proposes to divert water during February-April when eggs and larvae are present in the project area and are unscreenable. The EIR/EIS states that entrainment of Delta smelt eggs and larvae, given their present status, could significantly affect the population (p. 3F-28). The project proponents propose to monitor project diversions for Delta smelt and halt diversions if detected (p. 4-17). We concur with this proposal, however, the EIR/EIS lacks detailed information discussing how sampling will be conducted. This information is needed to determine if sampling is adequate to protect the population. Given that eggs and larvae are unscreenable, we believe that diversion of water should not take place when they are likely to be entrained, consequently, monitoring is very important. Diversion of water must not occur when Delta smelt eggs and larvae are present. Please include more information on sampling as part of this EIR process.

9. The project proponent proposes to "halt" diversions if Delta smelt larvae are present and to "avoid" diversions during March and April if it is determined at the water rights hearing that diverse impacts to winter-run smolt outmigration is significant (p. 4-17). We agree that diversions should be halted when necessary to protect Delta smelt and winter-run salmon. However, no clarification of the winter-run mitigation measure is given in the document (see p. 3F-42). We also do not think "avoid" is a reasonable term to be included in a water rights permit to protect winter-run salmon. When the impact of diversion or exportation to winter-run salmon is apparent, then water diversion or export should not be allowed; furthermore, it should not be up to the project proponents discretion on whether or not they can divert. R7-4 cont'd

10. There are no mitigation measures proposed for impacts to any fish species or life stage impacted at the State and Federal pumping plants due to the sale and exportation of Delta Wetlands water or to incremental impacts to most fish species directly impacted by operation of the Delta Wetlands project. The EIR/EIS frequently identifies small incremental impacts to most all fish species discussed, i.e., entrainment impacts on striped bass (p. 3F-28), increased predation on juvenile chinook salmon (p. 3F-32), increase movement of San Joaquin salmon smolt towards the CVP and SWP pumps (p. 3F-33), additional impacts to fall chinook salmon (p. 3F-33), increased impacts to chinook salmon due to 2F increase in temperature of released water (3F-37), impacts to spawning American shad (p. 3F-39), entrainment of Sacramento split-tail larvae and juveniles and white catfish (p. 3F-39). However, there are no mitigation measures proposed for these impacts.

In addition, the EIR/EIS states that impacts will occur to "Other Bay Species" and "other Delta Species", but states that impacts cannot be determined with available information. The EIR/EIS identifies potential impacts of reduced Delta outflow, which include reduced recruitment of marine species that rely on estuarine circulation to

distribute eggs and larvae, increased exposure to toxics caused by increased water residence time, and reduced habitat, temporarily and spatially, because of the more landward positioning of the null zone caused by lower Delta outflows (P. 3F-34). We request that these species be identified. In addition, no mitigation measures are proposed for these impacts.

Will you require an impact assessment at the State and/or Federal pumping plants for fishery impacts due to the additional water made available by the Delta Wetlands Project and that mitigation measures be proposed for those losses? Will other losses identified above be mitigated?

11. The EIR/EIS states that unscreenable striped bass eggs and larvae occur, sometimes in high numbers, during the month of April (p. 3F-27). Delta Wetlands has applied to divert water through April, although they indicate diversion in April would only occur in 1-2% of the years. We do not believe diversion should be allowed during April unless the project proponents demonstrate no impact to striped bass eggs and larvae. To this end, we request that detailed monitoring activities should be included in this EIR.

12. The EIR/EIS claims that several million striped bass eggs and larvae could potentially be saved under the proposed project because agricultural diversions (several TAF) would be eliminated (p. 3F-35). We do not agree with this assessment because the impact to striped bass eggs and larvae would still occur and would be greater than existing conditions; the impact would be shifted from the agricultural diversions (several TAF) to impacts associated with increased exportations (312 TAF) at the State and/or Federal pumps. In either case, we believe that monitoring should be required to demonstrate the actual level of impact. Will you require monitoring and mitigation for losses? R7-4 cont'd

13. The EIR/EIS proposes to negotiate with CDFG details of fish screen design characteristics such as approach velocity, mesh size, flow uniformity, and cleaning frequency to ensure effective operation (p. 2-20). Delta Wetlands should not be approved unless these details are worked out in advance; it should not be assumed that screening and monitoring requirements can be worked out after the project is permitted. Monitoring criteria should be identified, agreed upon by CDFG and other resource agencies, and should be required during all years to ensure protection of fishery resources. Will you require these details to be worked out before the project is permitted?

In addition, the EIR/EIS indicates that the fish screens proposed by the project proponent will only protect some fish species and life stages (p. 3F-27). The EIR/EIS lacks specific information on which species and life stages that will or will not be protected. Please include this information in the EIR/EIS.

14. On page 2-23, the project proponents propose to design the screens with a 5.0 fps initial approach velocity. The EIR/EIS states (p. 3F-9) that the preferred approach

velocity to screens is 3.0 to 3.5 fps. High approach velocities will make it harder for many fish species and life stages to avoid entrainment and impingement. We request that approach velocities be required to be designed below this range, and kept no higher then the preferred range during operation to ensure impacts are kept to a minimum.

Also, were project filling rates based on 5 fps intake velocities? If so, will you re-estimate filling times based on the lower intake velocities?

15. Delta Wetlands proposes to release stored water for probable exportation during May-July but the water rights application also asks to release in August (p. S-3). For the proposes of impact assessment only the May-July period was considered. Impact assessment should correspond directly with the period for diversion and release of water in the water rights permit, not with the time period currently proposed by Delta Wetlands. If water rights were granted through August, then Delta Wetlands could release all or most of the water in that month. However, this scenario was not considered. The EIR/EIS indicates that no impacts will occur in August (p. 3F-41). Is that because the project proponents don't anticipate on releasing water then? We believe that many of the impacts occurring during May-July releases could occur in August. Will you require an analysis of August releases? This requirement would not be necessary if the water rights application eliminated August for releasing water. R7-4 cont'd

16. CDFG has identified the summer months as an undesirable period for water export (for exiting water export projects) due to impacts to fisheries and has held meetings with DWR to reduce summer exports. The Delta Wetlands Project, however, would make additional water available during summer for exportation and would increase impacts at the State or Federal pumps over existing conditions. This proposed operation appears contrary to current efforts of CDFG. Some discussion of this issue should be included in the EIR/EIS.

17. CDFG has indicated that high flows during the winter through the Bay/Delta result in larger populations of Bay shrimp and that during low outflow, populations are smaller. Bay shrimp have a one-year life cycle and are an important food item for many fish species in the Bay/Delta. The EIR/EIS did not address the impacts of diverting winter water from the Bay/Delta on this resource. Impacts to the Bay shrimp should be examined as part of this EIR.

18. The survey methods as described on page 3H-4 of the DEIR are incomplete in determination of nesting values during nesting periods. Nest density values cannot be evaluated from stationary sites.

19. The Eastern side of Webb Tract Island was not available for habitat evaluation (see page 3H-14, Para. 2). The habitat values on that side of the island are not comparable to any other sites on the island, as there was no other areas being managed specifically for wildlife and farming compatibility. Further, wildlife values and wildlife use cannot be determined by aerial surveys.

20. The HEP team did not include waterfowl species in modeling that are year round and indigenous species to the DWP. Nor were these species' nesting needs and values adequately considered. The nesting needs and habitat values required by the Mallard, Gadwell, Teal, Wood Duck, Short-eared Owl, Marsh Hark, and Ringneck Pheasant are all year-round species and were not adequately studied or valued. Subsequent studies are needed! The nesting studies conducted by the Department of Fish and Game and the California Waterfowl Association at Grizzly Island Wildlife Area, should be used as a minimum base line when considering the nesting value and potential of the four Project Islands. How will mitigation for these species be determined? Where, when and how will mitigation for these loss be replaced? Will in-kind ecological environments be re-established?

21. Page 2-7 of the HEP Report states that major assumptions were made by the HEP team regarding DWP operation and long-term impact/effect on habitat conditions for wildlife. What percent of total project impact was tested on test sites? Does this percentage equal appropriate evaluation procedures for a project of such magnitude? Should a project of this magnitude be based on any assumptions? Who will assume liability if assumption are wrong? Will bonding be required? If so, how much of a bond will be required?

R7-4 cont'd

22. How will the early watering of the Project Islands be managed to ensure the prevention of botulism outbreaks?

23. Pages 2-27 through 2-29 of the HEP Report pointed out that the HEP team could not agree on HIS/food values for waterfowl. The HEP team failed to collect any waterfowl craw samples to empirically determine the actual foods being consumed by waterfowl during any time of the HEP study. Therefore, all findings concerning waterfowl food values are supposition and assumption on the part of the HEP team. If the major concern of the HEP seems to stem around the loss of late winter food for Tundra swan, and White-fronted goose, shouldn't the HEP team have taken samples of craw contents during study periods of January through May?

24. The HEP identified food values for waterfowl. These values focused on corn as a significant food factor to provide winter food supplies for these species. The value was based on the corn availability. Other food values incidental to agricultural/crops (i.e., root fibers, grasses, insects, etc.) need to be identified, and valued as to each species in their overall wintering needs. The HEP's Biological review did not adequately evaluate or identify subsidiary food values for wildlife of other habitats on the Project Islands.

25. On pages 2-9 and 2-30 of the HEP Report there is a discussion regarding habitat/food availability for waterfowl use at given water depth. In these discussions, food is presumed to be at the canopy levels of vegetation instead of at the bottom of pond. It is reasonable to assume that most seed will be knocked to the bottom by flooding and wind/wave action. Therefore, equations used to evaluate food availability during inundated condition should be from water surfaces to pond bottom.

26. A significant number of upland species will be displaced and lost due to project flooding. The mitigation of this problem as stated in the DEIR does not adequately address this problem. In addition, the diversity, breadth and distribution of varying ecological systems and their extremely important edge zones, are not adequately valued as a ecological gestalt as it inter-related to adjacent environmental needs. The broad and varied distribution of riparian woodland, riparian scrub, emergent wetlands, wetlands, ponds, upland, and croplands, are not valued. Will the project plan for mitigation of riparian and wetland habitat edge zones provided like/in-kind adjacent habitat values as pre-project provided?

27. Will nesting habitat mitigation provide more or less predator nest predation due to concentration and configuration of mitigation measures proposed on North Bouldin and the levees of other Project Islands?

28. Mitigation for habitat/wildlife losses should occur concurrently during the construction phases of the project. If not, a value of loss that will result during the lapse of time from beginning of project to completion of mitigation should be identified and provided for over and above the agreed upon base-line losses so that there shall be no overall net loss. In addition, if mitigation does not occur concurrently, then an appropriate bond for projected mitigation costs should be posted by project owners. R7-4 cont'd

29. There should be a rigorous review addressing the cumulative environmental Delta impact of all water-related projects in the region. Specifically the cumulative impact of the DWR's projects (LOS BAÑOS GRANDES, SOUTH DELTA WATER MANAGEMENT PROGRAM, WEST DELTA AND NORTH DELTA PROGRAMS) THE DELTA WETLANDS PROJECT AND LOS VAQUEROS RESERVOIR.

30. Mitigation for all habitat/wildlife losses occurring within Contra Costa County, as part of this project, should be mitigated within Contra Costa County. The County may require in-County mitigation as part of the permit process if appropriate, therefore, we recommend that it be included in the EIR/EIS.

If you should have any questions, please contact Roberta Goulart of our staff at (415) 646-2071.

Sincerely yours,

Harvey E. Bragdon
Director of Community Development

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17

April 15, 1991

California Water Resources Control Board
Division of Water Rights
901 P Street
Sacramento, CA 95816

U.S. Army Corps of Engineers
Regulatory Section
650 Capital Mall
Sacramento, CA 95814

Dear Gentlemen:

Thank you for the opportunity to review the Draft EIR/EIS on the Delta Wetlands Project. The documents provide an extensive range of information on this project. None-the-less there are questions which we feel need to be responded to in the Final document.

One area of concern deals with the local road circulation patterns. As indicated on page 3E-7 the Contra Costa County currently maintains Holland Tract Road which wraps around 3 sides of that island.

R7-4 cont'd

Reclamation District #2025 has requested that the County vacate it's interests in that Holland Tract Road to that District on both the western and eastern perimeter of the island northerly of the two marinas. Some time in 1991 the County shall consider this request. The Final EIR needs to examine what impact, if any, the vacation of this land would have on the proposed project. This is directly relevant to the issue of eliminating the public's right to use the roads and to fish off adjacent lands.

A similar area of concern is how this project might affect the financing of the ferry boat service to Bradford and Webb Tracts. Will the Delta Wetlands Project enhance or reduce the viability of the ferry boat service. Will the recreational users offset the loss of agricultural passengers and cargo that finance the ferry boat services.

A major area which requires expansion is the discussion of the hunting preserves. The draft EIR meticulously analyzes the impacts the operation of water related aspects of the project, however if fails to provide as much detail to the hunting and water related sports aspects of the project. How important are the hunting preserve facilities to the project viability? Can it succeed without all or some of the hunting clubhouses?

How will the hunting preserves receive potable water? If deep wells are to be the source of water, how will that effect subsidence? How will they handle sewage effluent? According to our understanding of Regional Water Quality Control rules, a public agency will be required to operate the sewage treatment facilities. What agencies are proposed to handle this functions in Contra Costa County? Is this a legitimate function which can be undertaken by the Reclamation Districts for each island? It can be anticipated that sphere of influence changes and annexations may be needed which are not discussed in the DEIR. Since the answers to these questions may affect agencies which aren't reviewers of this EIR e.g. the LAFCO's of each County or water and sewer agencies, will supplemental environment documents be prepared on the issue of providing facilities to the hunting preserve clubhouses?

On page 3I-23 the Draft EIR raises the issue whether reservoirs are consistent with the uses allowed in the existing County agricultural zoning districts. In previous discussions with the project applicant, County staff had expressed the opinion that the correct approach for the County to consider the issues of the hunting preserve facilities and other aspects of County approval which are required, would be for the DW lands to be rezoned to a Planned Unit Development District. We presume that Table 5-3 is sufficient to cover this concept. R7-4 cont'd

In reviewing the ownership of lands around Holland and Webb Tract, it appears that some adjacent tule berms may be under the control of the project applicant. Will this project cause any impact on these tule berms, for instance will they be hunted or will ownership of those tule berm areas transferred to a public agency to insure their long term preservation? This should be considered as a potential mitigation measure for the wildlife impacts of the project.

The project indicates substantial efforts to ensure levee stability and to attempt to protect adjacent levees from seepage. There is a concern that this project increase instability to adjacent islands and that should the project levees fail, that the levees will be repaired to protect adjacent land areas. No mitigation measure appears to be discussed in the DEIR which would require rapid repair of breached levees. Measures such as bonding for levee repair in case of failure should be considered.

Webb and Holland Tracts both abut Franks Tract State Park. Part of Franks Tract park has been suggested for a wildlife preserve. The Final EIR needs to clarify any anticipated impacts that the project will have, on that State Park facility.

On page 36-60 and 36-61, the document points out that hunting club houses are proposed within 200 feet of special status species on both Webb and Holland Tracts. The Final EIR should clarify if the mitigation measures on page 36-67, first two paragraphs, actually resolve the problem or if relocation (or elimination) of the clubhouses wouldn't be more effective mitigation.

R7-4 cont'd

Portions of the Delta already have high levels of recreational use, especially boaters. Bethel Island, the Gateway to the Delta, is located next to Holland Tract. On summer weekends and holidays boat use in this area is high. Will there be any conflict or competition between their commercial marinas on Bethel Island and the hunting preserve clubhouse boat ramps?

Upon finalization of the EIR/EIS process, the County looks forward to reviewing the project on it's merits.

Sincerely yours,

James W. Cutler
Assistant Director,
Comprehensive Planning

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Contra Costa County Community Development Department

R7-1. See responses to Comment Letter C13.

R7-2. Delta Wetlands Project impacts on fisheries, drinking water quality, and Los Vaqueros Reservoir operations were addressed in the 2000 REIR/EIS. The change in water quality attributable to salinity and DOC in water discharged from the Delta Wetlands Project islands is expected to have minimal biological effects in the Delta and could increase availability of food for Delta fishes (see page 3F-16 in the 1995 DEIR/EIS [page 3F-17 in FEIS Volume 1]). See responses to Comment Letter R8 from CCWD regarding impacts on drinking water quality. See also response to Comment C9-22 for information about measures that will ensure that Delta Wetlands will not interfere with CCWD's ability to meet the terms of the Los Vaqueros Project biological opinions.

R7-3. See responses to Comment Letter C13.

R7-4. Delta Wetlands originally applied for water rights to store water seasonally on all four project islands. The Delta Wetlands Project, as originally proposed, was analyzed in a DEIR/EIS released in December 1990. Delta Wetlands submitted a revised water right application in August 1993 and revised its project description to propose using two islands for water storage and two islands to compensate for wetland and wildlife impacts of the operation of those reservoir islands. The information and analyses in the 1995 DEIR/EIS supersede the information and analyses contained in the 1990 DEIR/EIS. These letters (dated April 30, 1991 and April 15, 1991), attached to Contra Costa County Community Development Department's submittal to the SWRCB, are comments on the 1990 DEIR/EIS and therefore are no longer applicable to the proposed project.

Letter R8

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Subject: Revised Draft Environmental Impact Report/Environmental Impact Statement for the Delta Wetlands Project dated May 31, 2000

Dear Mr. Sutton and Mr. Finan:

This letter sets forth the comments of the Contra Costa Water District ("CCWD" or "District") on the Revised Draft Environmental Impact Report and Environmental Impact Statement ("EIR/EIS") for the Delta Wetlands Project ("Project") dated May 31, 2000.

The stated objective of this Revised Draft EIR/EIS is to address outstanding issues identified subsequent to the release of, and not adequately addressed in, the September 1995 Delta Wetlands Project Draft EIR/EIS, including, but not limited to, adverse Project impacts on the water supply and water quality of CCWD and other drinking water utilities using Delta water, as discussed in detail in State Water Resources Control Board's (SWRCB) November 25, 1998, letter to Delta Wetlands Properties (Walt Pettit to Anne Schneider). A subsequent SWRCB letter to Delta Wetlands Properties (Harry M. Schueller to Anne Schneider, dated July 16, 1999) sets forth the intended scope of the Revised Draft EIR/EIS and the approaches to be used to address each one of the outstanding issues: to summarize the issue, identify the new information and/or analysis, describe the revisions made to the analysis, and present the recommended changes in impact analyses and mitigation measures "Work Plan"). As is described more fully below, the Revised Draft EIR/EIS fails to adequately conform to the Work Plan set forth in the July 16, 1999 letter.

The District has previously provided extensive comments on many of the outstanding issues addressed in the May 2000 Revised Draft EIR/EIS, for example in CCWD's December 20, 1995 comment letter on the September 1995 Draft EIR/EIS (Walter J. Bishop to Jim Sutton, SWRCB, and Jim Monroe, U.S. Army Corps of Engineers) and in CCWD's exhibits and testimony for the 1997 State Water Resources Control Board Hearing ("Hearing") on Delta Wetlands Project Water Rights Applications. These documents are hereby incorporated by reference. Regrettably, many of the District's previous comments have again not been addressed in a meaningful manner in the Revised Draft EIR/EIS. **R8-1**

The May 2000 Revised Draft EIR/EIS fails to provide adequate analyses, fails to include sufficient details to comply with the disclosure purposes of CEQA and NEPA and to facilitate the purposes of the public review process, which include "sharing expertise, ... checking for accuracy, detecting omissions, discovering public concerns, and soliciting counter proposals" (CEQA Guidelines §15200), and contains significant analytic errors on a number of the outstanding issues, the effect of which is to grossly underrepresent the environmental consequences of the proposed project. The Revised Draft EIR/EIS:

1. Fails to adequately assess or disclose the impacts of the Project on CCWD and its customers. There is already substantial evidence in the record that the proposed Project will result in unacceptable adverse effects on municipal and industrial water supplies and injure CCWD and its customers by impairing the beneficial uses of water delivered by CCWD to the 430,000 people living within the District's service area. Unless adequate mitigation measures are proposed, adopted, and implemented, there is substantial evidence that the proposed Project will:
   a. Increase salinity at the District's drinking water intakes in many months by significantly reducing Delta outflow; **R8-2**
   b. Increase the concentration of drinking water contaminants by discharging from Project islands poor quality water with high concentrations of organic carbon, algae, salt, and possibly other contaminants;
   c. Increase acute and chronic public health risks caused by higher levels of disinfection by-products as a result of higher salinity and organic carbon concentration in the District's water supply;
   d. Impair the operation and significantly degrade the overall performance and water quality, emergency reliability, and ecosystem benefits of the District's recently completed Los Vaqueros Project;

2. Contains serious methodological errors and does not provide adequate and accurate disclosure of the Project's water quality impacts. The Revised Draft EIR/EIS:
   a. Significantly underestimates Project impacts at CCWD's Delta intakes. The Revised Draft EIR/EIS reports the water quality impacts <u>only</u> as aggregated averages of water quality at CCWD's diversion points and the State Water Project and Central Valley Project export **R8-3**

pumps (that is, as a single "export chloride" concentration), even though the Revised Draft EIR/EIS admits that the water quality and Project impacts at these three geographically distinct intakes are significantly different;

b. Uses a salinity simulation model that has unacceptably large errors. The model often under-predicts salinity at compliance locations at times of high salinity, by as much as 40% of the measured data. Because the Revised Draft EIR/EIS also improperly uses a significance criterion that considers Project impacts as large as 20% as less-than-significant (unless the salinity is within 90% of a water quality standard), Project impacts reported in the Revised Draft EIR/EIS as less-than-significant would have caused significant degradation and in some cases considerable exceedance of an applicable water quality standard;

c. Underestimates the Project's impacts on organic carbon concentration at the Delta's drinking water supply intakes. As a result, Project impacts on disinfection by-products level at CCWD's treatment plants and the resulting increase in public health risk are significantly underestimated;

d. Alters an established mathematical model used to estimate Project impacts on total trihalomethanes formation without a reasoned justification or substantial evidence. This leads to unverifiable model results of unknown accuracy which cannot be relied upon for assessing Project impacts; **R8-3 cont'd**

e. Fails to even attempt to quantify the Project's impacts on bromate formation by arbitrarily dismissing a model that is widely accepted, published in peer-reviewed academic journals, and currently used by the U.S. Environmental Protection Agency in developing national drinking water regulations;

f. Improperly concludes significant environmental impacts as less-than-significant based on analyses using grossly inadequate significance criteria and an inaccurate water quality impact simulation model;

g. Fails to disclose Project impacts on the District's Los Vaqueros Project and the District's water quality goal of 65 mg/L chloride for delivered water;

h. Fails to document and justify substantial changes in an established model for predicting salinity in the Delta. This leads to results and conclusions on Project impacts that are unreliable and inadequate for disclosing environmental impacts under the California Environmental Quality Act and the National Environmental Policy Act;

3. Fails to provide adequate and enforceable mitigation measures for identified significant impacts, including those that have unacceptable adverse impacts on CCWD's municipal and industrial water supplies. **R8-4**

Details of these comments are discussed in the Appendices to this letter.

The Revised Draft EIR/EIS is deficient in numerous respects. The California Environmental Quality Act and the National Environmental Policy Act require an EIR/EIS to adequately disclose all environmental impacts and provide sufficient information on mitigated Project operations. The **R8-5**

Revised Draft EIR/EIS is legally required to contain detailed mitigation measures to ensure that the Project does not significantly affect Delta water quality, that the Project does not impair the beneficial uses to which the water is put, that the Project does not adversely affect the users of the water supplied by CCWD, that the Project does not cause unacceptable adverse impacts on municipal and industrial water supplies, and that the Project does not adversely impact the operations of CCWD's Los Vaqueros Project. To meet these statutory requirements, the District submits that the Revised Draft EIR/EIS must be revised again to comply with the Work Plan set forth in the July 16, 1999 letter and to address the comments and disclosure requests discussed in this letter. The revised document must then be re-circulated for additional review and comment. **R8-5 cont'd**

The District would welcome an opportunity to discuss its concerns and supply further details on the technical issues raised in this letter. If you have any questions, please contact me at (925) 688-8187.

Sincerely,

Richard Denton
Water Resources Manager

Appendix A — Detailed Comments of the Contra Costa Water District on the Revised Draft Environmental Impact Report/Environmental Impact Statement for the Delta Wetlands Project

Appendix B — Summary list of additional information that must be included in the Project EIR/EIS

RAD/KTS/LMH

Delta Wetlands file

cc: City of Antioch
California Urban Water Agencies
Delta Wetlands Properties

Appendix A

Detailed Comments of the Contra Costa Water District on the Revised Draft Environmental Impact Report/Environmental Impact Statement For the Delta Wetlands Project dated May 31, 2000

This Appendix provides detailed discussions of the potential impacts of the proposed Delta Wetlands Project ("Project") on the facilities and operations of the Contra Costa Water District ("CCWD" or "District") and CCWD's detailed comments on the Revised Draft Environmental Impact Report and Environmental Impact Statement ("EIR/EIS") for the Project dated May 31, 2000. This Appendix is divided into five sections:

I. CCWD's drinking water facilities and operations
II. Project impacts and mitigation measures
III. Methodological deficiencies in the Revised Draft EIR/EIS
IV. Deficiencies in the analyses and scope of the Revised Draft EIR/EIS under the pertinent provisions of the California Environmental Quality Act, Pub. Res. Code §21000 *et seq* ("CEQA") and the National Environmental Policy Act, 42 U.S.C. §4321 *et seq* ("NEPA")
V. Adverse impacts to CCWD caused by increased salinity and concentrations of organic carbon and other constituents of concern at CCWD's intakes

Materials in the Revised Draft EIR/EIS are referred to in *underlined-italics* in the following.

I. CCWD Facilities and Operations

The Contra Costa Water District serves approximately 430,000 people throughout north, central, and east Contra Costa County. Its clients also include 10 major industries, 36 smaller industries and businesses, and 50 agricultural users. CCWD operates raw water distribution facilities, water treatment plants, and treated water distribution facilities. CCWD supplies raw and treated water to Antioch, Concord, Diablo Water District (serving Oakley), Pittsburg, Southern California Water Company (serving Bay Point), Martinez, and parts of Pleasant Hill and Walnut Creek.

CCWD's treated water service area encompasses all or part of the cities of Concord, Clayton, Clyde, Pleasant Hill, Walnut Creek, Martinez, and Port Costa. Treated water for this service area is provided from the District's Bollman Water Treatment Plant in Concord. The 75 MGD Bollman facility uses chlorination for pre-oxidation, chlorination and intermediate ozonation for disinfection, and chloramine as disinfectant residuals. CCWD also supplies treated water to the Diablo Water District ("DWD"), which serves customers in Oakley from a plant jointly owned by CCWD and DWD. This Randall-Bold Water Treatment Plant is a 40 MGD direct/deep-bed filtration plant and

utilizes both pre- and post-ozonation to provide a high quality drinking water to the customers in its service area.

CCWD is entirely dependent on the Delta for its water supply. The Contra Costa Canal and pumping facilities and the recently completed Los Vaqueros Project make up CCWD's principal water supply and delivery system. CCWD diverts unregulated flows and regulated flows from storage releases from Shasta, Folsom, and Clair Engle reservoirs into the Sacramento River as a contractor of the United States Bureau of Reclamation's ("Bureau") Central Valley Project ("CVP"). Under Water Service Contract I75r-3401 (amended) with the Bureau, CCWD can divert and re-divert up to 195,000 acre-feet annually ("AFA") of water from Rock Slough and the new Old River intake. Currently, CCWD uses between 125,000 and 140,000 AFA. CCWD can also divert up to 26,780 AFA of water under its Mallard Slough water rights (Water Rights License No.3167 and Permit No.19856). The City of Antioch and Gaylord Container, both customers of the District, also have their own water rights entitling them to divert water from the Delta.

CCWD has obtained its water supply from the Delta since 1940. Delta water is subject to large variations in salinity and mineral concentrations. CCWD and its customers' water supply from the Delta is also vulnerable to any man-made or natural sources that could degrade Delta water quality. Degradation in water quality is objectionable to CCWD customers, costly to residential and industrial users, and increases public health risk. The most recent federal drinking water regulations, promulgated in December 1998 by the U.S. Environmental Protection Agency, impose stringent limits on disinfection by-products in treated water. To ensure that the standards for the principal disinfection by-products that are currently regulated (maximum concentration limits for bromate, total trihalomethanes, and haloacetic acids) are met, low bromide and organic carbon levels in the source water are critical. Bromide level is directly proportional to chloride concentration in Delta water.

Contra Costa Water District is committed to supplying its customers with the highest quality water practicable and providing all reasonable protection of the supply from any known or potential source of hazardous contamination. CCWD Resolution No. 88-45 states in part that:

> *"CCWD is committed to reducing the concentration of sodium and chloride in the District's water, thereby reducing household and landscape irrigation concerns and industrial and manufacturing costs caused by the fluctuating sodium and chloride level of CCWD's Delta source...."*

In May 1987, CCWD's Board of Directors adopted water quality objectives for water distributed within its service area. The acceptable concentration levels for sodium and chloride were established at 50 milligrams per liter (mg/L) and 65 mg/L, respectively. In 1988, the voter-constituents of CCWD approved the issuance of bonds to finance the $450,000,000 Los

Vaqueros Project. The primary purposes of the Los Vaqueros Project are to improve the quality of water supplied to CCWD customers and minimize seasonal quality changes, and to improve the reliability of the emergency water supply available to CCWD. The Los Vaqueros Project consists of a reservoir with 100,000 acre-feet of storage, a new point of diversion (at Old River south of the State Highway 4 crossing) which operates in conjunction with the current Rock Slough diversion point, water conveyance and delivery facilities, pumping plants, and other facilities.

On June 2, 1994, the State Water Resources Control Board issued Decision 1629, which gives CCWD additional rights to divert and store water for beneficial uses. The State Board subsequently issued Water Rights Permits No.20749 and 20750 for filling Los Vaqueros Reservoir from the new intake at Old River near State Highway 4 and diversion and storage of the water of Kellogg Creek. These rights are in addition to the contractual rights to divert and store water furnished through the CVP. Construction of the reservoir began in September 1994 and was completed in January 1998. Diversion from the Old River intake for delivery to CCWD's service area began in the summer of 1997. Under Water Rights Permit No.20749, up to 95,850 AFA may be diverted for storage between November 1 of each year to June 30 of the succeeding year. On January 28, 1999, the Los Vaqueros Reservoir was filled to 100,000 acre-feet for the first time. In February 1999, CCWD released water from the reservoir for the first time for use in the District's service area. Releases from the reservoir are also scheduled to provide net benefits to the Delta ecosystem by allowing CCWD to cease all diversions during fish sensitive periods.

The key to successful performance of the Los Vaqueros Project is the District's ability to fill and continue to refill the reservoir from Old River with high quality water, and to use that high quality water for blending when salinity at the District's Delta intakes exceed the 65 mg/L chloride goal. Any increase in Delta salinity caused by new Bay-Delta projects will increase the demand on blending water from the reservoir and at the same time reduce the availability of high quality water for refilling. The District and the 430,000 people living in its service area will be injured through higher pumping costs to replace the extra blending water that has to be released, through additional treatment costs, and through increased corrosion and health risks of a higher salinity water supply.

II. PROJECT IMPACTS AND MITIGATION MEASURES

Unless adequate mitigation measures are proposed, adopted, and implemented, operations of the Delta Wetlands Project will have a number of significant adverse impacts on CCWD's water supply and water quality. These impacts can be classified as (a) impacts caused by Project diversions, (b) impacts caused by discharges from Project islands, and (c) other impacts. The Project will increase salinity, organic carbon, and possibly pathogens and other constituents of concern at the District's **R8-6**

intakes and injure CCWD as a legal user of Delta water and its 430,000 customers. The adverse impacts to CCWD caused by increased salinity and concentrations of organic carbon and other constituents of concern at CCWD's intakes are discussed in further detail in Section V of this Appendix.

Analyses in the Revised Draft EIR/EIS grossly underestimate these Project impacts. Section III of this Appendix discusses these methodological deficiencies in detail. The District submits that the findings of less-than-significant for a number of water quality impacts in the Revised Draft EIR/EIS are based on a simulation model with an error of unacceptable magnitude and a significance criterion threshold so large that it mocks the mandate of full disclosure of environmental impacts under both the California Environmental Quality Act ("CEQA") and the National Environmental Policy Act ("NEPA"). **R8-6 cont'd**

For those impacts that the Revised Draft EIR/EIS acknowledges are significant or potentially significant, insufficient details are disclosed to enable a reader to evaluate or comment upon the mitigation measures proposed. Neither the operation nor the environmental impacts of the modified Delta Wetlands Project with these mitigation measures in place are even cursorily disclosed. **R8-7**

The Revised Draft EIR/EIS is also inadequate because it fails to meet CEQA and NEPA requirements on disclosing cumulative impacts. Except for the higher allowable pumping rate at Banks, the Revised Draft EIR/EIS fails to consider any of the numerous reasonably foreseeable proposed projects that could affect water quality in the Delta. The Revised Draft EIR/EIS must be revised to include impact analyses of the Project in conjunction with south Delta barriers, CALFED Bay-Delta Program preferred alternative components, and other reasonably foreseeable future projects in the Bay-Delta and Central Valley that could cumulatively increase Project impacts. The new analyses must be re-circulated for public review and comments. These analyses must be included in the Final Project EIR/EIS, along with revisions addressing the latest public comments. **R8-8**

The environmental impact analyses in the EIR/EIS must be appropriately revised to address the comments discussed in this Appendix. An adequate disclosure of the mitigated Project operations and the environmental impacts resulting thereof, once prepared, must be circulated for public review and comments before the lead agencies consider certifying the EIR/EIS. The Revised Draft EIR/EIS must be further revised and re-circulated for public review and comments. **R8-9**

The following is a discussion of the significant impacts of the Delta Wetlands Project on the District that would require further analyses to meet CEQA and NEPA requirements. Potential mitigating measures for these impacts are also included in the discussion.

A. Impacts of Delta Wetland diversions

The Delta Wetlands Project will increase the salinity at CCWD's Delta drinking water intakes by significantly reducing Delta outflow. As discussed in Section III, the Revised Draft EIR/EIS is inadequate because it fails to quantify the Project impacts with an acceptable accuracy and uses significance criteria with thresholds that are too large to be consistent with CEQA and NEPA requirements. The perfunctory conclusion that the impact on chloride concentration at Delta drinking water intakes is less-than-significant is not supported. Moreover, the Revised Draft EIR/EIS is inadequate because this salinity impact analysis is fundamentally flawed and does not meet the minimum requirements of environmental impact analysis set forth under CEQA and NEPA. A "hard look" at the water quality impacts of the proposed project would involve the use of a validated Delta hydrodynamic and salinity model, such as the Fischer Delta Model, to provide reliable disclosure of the Project impacts on salinity at CCWD's intakes and other compliance locations, as required by CEQA Guidelines §15384 ("substantial evidence").

Notwithstanding the requirement in the Work Plan that it does so, the Revised Draft EIR/EIS has failed to provide anything more than a perfunctory justification for maintaining the same significance criteria as the 1995 Draft. The District further requests that the significance criteria to be used to assess the water quality impacts of the proposed project be sufficiently restrictive to be consistent with the full disclosure purposes of both CEQA and NEPA. To this end, the District submits that a maximum of 5% Project-induced increase in the water quality parameters of concern, including, but not limited to, salinity (quantified as electrical conductivity and chloride and bromide concentration) and concentrations of organic carbon (both dissolved and particulate) and disinfection by-products (bromate, trihalomethanes, haloacetic acids, etc.) should be used in the Revised EIR/EIS. **R8-10**

The Revised Draft EIR/EIS is also inadequate because it fails to disclose the proposed Project's significant impacts on the operation of CCWD's $450 million Los Vaqueros Project and on CCWD's ability to meet its adopted water quality goal. Because the Revised Draft EIR/EIS only discloses salinity impacts at CCWD's Rock Slough and Old River intakes in terms of a single combined "export chloride" concentration, the District is unable to estimate how Project impacts will affect CCWD's ability to fill its Los Vaqueros Reservoir and make reservoir releases to blend with Rock Slough and/or Old River diversions to meet CCWD's 65 mg/L chloride concentration goal for delivered water.

The Revised Draft EIR/EIS must propose actions to mitigate these significant impacts [California Public Resources Code §21081.6, CEQA Guidelines §15126.4]. Ample opportunity exists for the Project to significantly reduce adverse salinity impacts on CCWD when diverting to Project reservoir islands while having minor impacts on Project water delivery. For example, *Table 4-19* shows large chloride increases at urban intakes in the Delta

caused by Project operations in water year 1980. Water with high salinity (*Tables 4-8, 4-10*) is diverted in December 1979 at times of low Delta outflow (*Table 3-5*), leading to large chloride increase at the intakes. This high salinity stored water is subsequently released from Project reservoirs in June and July 1980 (*Table 3-23*), causing large chloride increase at the intakes when the ambient water quality is generally good (*Table 4-12*). In this example, Project impacts would have been significantly reduced if diversion were made one or two months later, and would have little or no impacts on Project water delivery. The Revised Draft EIR/EIS is inadequate because it fails to propose and analyze mitigation measures that use additional criteria for reservoir island filling. Measures such as a higher minimum Delta outflow and/or lower maximum X2 location and chloride concentration at urban intakes for Project diversions must be considered to avoid adverse impacts on Delta water agencies. CEQA and NEPA require that all proposed mitigation actions be discussed in sufficient detail to enable the public to become informed of their efficacy, and that adequate environmental analyses are performed to ensure that the mitigation measures will in fact reduce significant impacts to a true level of insignificance. The Revised Draft EIR/EIS falls short on both counts. **R8-10 cont'd**

B. Impacts of Delta Wetland discharges

Water stored on a shallow reservoir over an extended period of time will necessarily increase in salinity and organic carbon concentration. The peat soil on the Project islands and the high nutrients concentration in Delta water further accelerate the build up of organic carbon concentration in the stored water and increase the organic carbon concentration at Delta drinking water intakes when the stored water is released. The impact analysis in the May 2000 Revised Draft EIR/EIS fails to analyze the full range of potential organic carbon concentration in Project stored water despite the voluminous information that has become available since the 1995 Draft EIR/EIS was released. It fails to assess the corresponding increase at Delta intakes when the water is released.

Release of Project stored water will also necessarily increase salinity at the District's Delta water supply if the salinity of the discharge from Delta Wetlands islands exceeds that of the receiving water. **R8-11**

Project-related increases in organic carbon concentration and bromide at Delta intakes could have significant adverse impacts on CCWD by increasing bromate, trihalomethanes, haloacetic acids, and other disinfection by-products produced during the water treatment process and thereby increasing the public health risk. CEQA Guidelines §15065(d) mandates a finding of significance if a proposed project will cause substantial adverse effects on human beings, either directly or indirectly. Thus, the Revised Draft EIR/EIS must mitigate this significant impact. In addition, the Revised Draft EIR/EIS fails to meet CEQA and NEPA requirements because it fails to provide a meaningful and reliable disclosure, in good faith, of Project impacts on disinfection by-products and public health.

Section III in this Appendix discusses the significant methodological errors in the Revised Draft EIR/EIS in assessing the Project's water quality impacts. The District has identified serious errors in the estimates of the potential range of organic carbon concentration in Project stored water, in relating the concentration of water quality parameters in stored water to impacts at the District's intakes, and in disclosing the Project impacts on the disinfection by-products concentrations at these intakes and the increase in public health risk. As a result, the Revised EIR/EIS fails to take a "hard look" at the environmental impacts of the proposed project.

R8-11 cont'd

Despite the serious methodological errors which significantly underestimate the water quality impacts, Chapter 4 in the Revised Draft EIR/EIS demonstrates that the Project would adversely impact urban water agencies by causing substantial increase in organic carbon and disinfection by-products concentrations at Delta intakes.

CEQA and NEPA require an EIR/EIS to propose adequate and practicable mitigation measures in sufficient detail for all significant and potentially significant impacts. The District has previously and repeatedly requested that the Project proponents consider a number of mitigation measures to reduce the Project's impacts on salinity and organic carbon at Delta intakes. These comments are discussed in detail in the District's comment letter on the 1995 Draft EIR/EIS and the District's exhibits and testimony in the 1997 Water Rights Hearing and are hereby incorporated by reference.

C. Cumulative Impacts

CEQA and NEPA require that an EIR/EIS address the cumulative effects of proposed projects. CEQA Guidelines §15130(b)(1) defines the scope of cumulative impacts analysis to include either "A list of past, present, and reasonably anticipated future projects producing related or cumulative impacts, including those projects outside the control of the agency" or "A summary of projections contained in an adopted general plan or related planning document which is designed to evaluate regional or area-wide conditions. Any such planning document shall be referenced and made available to the public ...". The Revised Draft EIR/EIS is inadequate because it fails to meet this statutory requirement by erroneously considering only the "most likely change...that would directly influence proposed Delta Wetland operations" (*page 3-26* to *3-27*). The assertion that it "represents reasonably foreseeable future Delta conditions and regulatory standards" (*page 4-47*) is not supported by substantial evidence. **R8-12**

The Revised Draft EIR/EIS fails to disclose Project impacts under foreseeable future conditions. Section A.4 in Attachment A to the June 2000 CALFED Final Programmatic EIR/EIS includes a list of projects that will be or likely to be implemented over the life of the proposed Delta Wetlands Project. A number of these projects would, when considered

together with the Delta Wetlands Project, compound or increase the impacts on salinity and concentrations of organic carbon and disnfection by-products to the water supply of Delta water agencies. The cumulative impacts analysis in the Revised Draft EIR/EIS must, at a minimum, evaluate the cumulative effect of these projects

The cumulative impacts analysis in the Revised Draft EIR/EIS must also recognize that Delta water is already severely impaired as a source for drinking water and as an ecosystem. Delta waterways are listed under Clean Water Act §303(d) as significantly impaired for electrical conductivity ("EC"), unknown toxicity, and organic enrichment (organic carbon and other nutrients). Suisun Marsh wetlands are listed for salinity, low dissolved oxygen and salinity. Lower San Joaquin River is listed for salinity. Total Maximum Daily Load limits are required by law to reduce the pollutant levels in these impaired waters. The waters of California are also subject to the National Toxics Rule, state and federal anti-degradation policies, and the California Toxics Rule. The ongoing Triennial Review of the Sacramento-San Joaquin River Basin Plan conducted by the state's Regional Water Quality Control Board, Central Valley Region, will establish water quality standards for drinking water beneficial use. The Revised Draft EIR/EIS must analyze the cumulative impacts of the projects referenced in the preceding paragraph in the legal context described above, including these imminent water quality standards for drinking water beneficial use. The excessively large thresholds of significance used in the Revised Draft EIR/EIS prevent the public from evaluating the extent to which the proposed project would degrade Delta water quality, in conflict with long-term environmental goals and the existing and applicable laws of the state of California and the United States. **R8-12 cont'd**

III. METHODOLOGICAL DEFICIENCIES IN THE REVISED DRAFT EIR/EIS

The Revised Draft EIR/EIS contains a large number of methodological and technical flaws which may not be apparent to the general public but which affect the accuracy and reliability of the environmental impacts analysis for the proposed Project and the validity of virtually all of the conclusions reached concerning water quality impacts. Similarly, a number of erroneous assumptions and inaccurate methodology used in the Revised Draft EIR/EIS could substantially affect the document's results and conclusions. To comply with CEQA and NEPA disclosure requirements, a number of the sections of the Revised Draft EIR/EIS must be revised according to the comments discussed in this Appendix. The new revisions must then be re-circulated for additional review and comments. The following is a description of the more significant methodological and technical flaws of the Revised EIR/EIS:

1. The Revised Draft EIR/EIS is inadequate because it fails to reliably disclose Project impacts on water quality at CCWD's and other Delta drinking water intakes

The water quality model (DeltaSOQ) used in the Revised Draft EIR/EIS assumes that the water quality at municipal intakes of the State Water Project ("SWP") at Clifton Court Forebay, Central Valley Project ("CVP") at Tracy Pumping Plant, and CCWD at Rock Slough and Old River are identical. The model implicitly assumes that the water quality impacts of the Delta Wetlands Project at these intakes are identical, regardless of the distances of the individual intakes from the Project discharge locations. In reality, as the Revised Draft EIR/EIS elsewhere admits, water quality at the SWP, CVP, and CCWD intakes can be, and often are, significantly different. The close proximity of CCWD's two primary intakes to the Project discharge locations makes CCWD more vulnerable to the potentially high salinity and organic carbon reservoir discharges from the Project. The averaged Project impacts disclosed in the Revised Draft EIR/EIS, even if they had been accurate, significantly under-report the magnitude of water quality degradation at CCWD's intakes caused by the proposed Project.

A more detailed hydrodynamics and water quality model must be used to identify the Project impacts at CCWD's intakes. The District has previously discussed this same issue in detail in a comment letter reviewing the draft water quality technical appendices of the 1995 Draft EIR/EIS (Richard Denton to Jim Sutton, SWRCB, letter dated February 10, 1995) and again in a comment letter on the 1995 Draft EIR/EIS after its release (Walter J. Bishop to Jim Sutton and Jim Monroe, December 20, 1995). The current Revised Draft EIR/EIS does not even acknowledge, let alone address these concerns, notwithstanding the directive to summarize significant issues. **R8-13**

The District therefore repeats its requests that more detailed water quality simulations are performed, for example, by using a validated Delta hydrodynamic and water quality simulation model such as the Fischer Delta Model. A well-calibrated and verified simulation model is critical to reliable disclosure of Project impacts at individual locations in the south Delta and elsewhere. Without an accurate simulation model, adequate environmental impact analyses would not be possible and the EIR/EIS will remain inadequate in meeting CEQA and NEPA requirements. The water quality impacts analysis must be revised to disclose the different adverse impacts at each of the urban drinking water intakes in the Central and South Delta, including CCWD's Rock Slough and Old River intakes, and re-circulated for public comment and review.

2. Water quality simulation model DeltaSOQ has large inherent errors and results in erroneous determination of Project impacts

R8-14

The model used for water quality simulation (DeltaSOQ) significantly under-predicts salinity at Chipps Island and Emmaton. For example, the comparison of model results to historical

data in *Figure G-4* shows that the model under-predicts salinity at Chipps Island at times of salinity intrusion. The magnitude of this underestimate is more than 30% of the measured salinity, for example in the summer of 1972, beginning of water year ("WY") 1987, spring of 1988, WY 1991, and beginning of WY 1994. Similarly, the model also predicts much lower salinity than actual at Emmaton in WYs 1977, 1991 and 1992. Model predictions for Jersey Point are not discernible in *Figure G-4* and accordingly cannot be compared with measured data.

More to the point, the model also predicts significantly different salinity than the actual measured data at CCWD's Rock Slough intake most of the time (*Figure G-6*). In particular, the model predicts a smaller range of chloride variation than was actually measured in most of the years presented. Of most concern to the District is the under-prediction at times of high salinity at Rock Slough. For example, model results predict a chloride of under 100 mg/L at times when the actual measured historical chloride was over 200 mg/L in WY 1990. Similarly, model results predict a chloride of between 160 and 180 mg/L when historical chloride was between 195 and 235 mg/L in WY 1991. **R8-14 cont'd**

On the other hand, the model significantly over-predicts chloride at Rock Slough during periods when the historical measurements were low (*Figure G-6*). In fourteen (WYs 1972-5 and 1978-87) of the twenty years of comparison, there are numerous months when measured Rock Slough chloride is considerably below 50 mg/L when the model predicts chloride of 50 mg/L or higher. Note that chloride at CCWD's Los Vaqueros intake at Old River is usually even lower at times when chloride at Rock Slough is low.

The large error in model predictions leads to a water quality impact analysis that is fundamentally flawed in the following ways:

- The Revised Draft EIR/EIS adopts a significance criterion that considers a Project impact on salinity that could be as large as 20% as less-than-significant unless the salinity is within 90% of an applicable standard ("20%/90% criterion").[1] At times of high salinity, the potentially large under-prediction of model results could erroneously predict a salinity under the No Project alternative to be well below an applicable salinity standard, when in reality the salinity would have been close to the standard. As a consequence, a Project impact that causes water quality to significantly exceed that standard in reality is disclosed as less-than-significant in the Revised Draft EIR/EIS, when the model under-predicts and erroneously predicts the salinity increase to be within the 20%/90% criterion. **R8-15**

[1] The District considers such a large threshold as significance criterion inappropriate and violates both the letter and spirit of CEQA and NEPA. This is discussed separately in greater detail in Section III.6 of this Appendix.

- Project impacts on the chloride concentration at CCWD's intakes presented in Chapter 4 of the Revised Draft EIR/EIS are inconsistent with Project operations and are most likely erroneous. The decrease in "export chloride" in a number of months presented in *Table 4-19* defies reason:
  - In Jan 1981, mean "export chloride" is purported to decrease by 12.5 mg/L, when compared to the "No Project" alternative, when the Project is diverting at a monthly-averaged rate of 3,871 cfs (*Table 3-13,16)*. It defies reason that reducing Delta outflow could improve Delta salinity by the amount reported. **R8-16**
  - In June and July 1985, the monthly averaged "export chloride" is purported to decrease by more than 13 mg/L, compared to the "No Project" alternative, at a time when the Project is neither diverting nor releasing under the "unlimited demand" conditions (*Table 3-14*), or releasing only in June under the ""limited by south-of-Delta delivery deficits" conditions (*Table 3-17)*. It is not clear how this "salinity benefit" could come about.

- Section III.7 in this Appendix provides substantial evidence that the District's 65 mg/L chloride goal is an appropriate salinity objective for the environmental impact analysis. The District's ability to meet this chloride goal is critically dependent on the availability of high quality water for diversion at the District's Old River intake (typically a chloride concentration of 50 mg/L or less). As discussed above, DeltaSOQ over-predicts salinity at south Delta locations at times of low Delta salinity and would not provide an adequate analysis to fully disclose the Project's impacts on Los Vaqueros operations. **R8-17**

Thus, the salinity impact analysis in the Revised Draft EIR/EIS is inadequate and fundamentally flawed and does not meet the minimum disclosure requirements of environmental impact analysis set forth in CEQA and NEPA. The District repeats its requests that a validated Delta hydrodynamic and water quality model, such as the Fischer Delta Model, be used to provide a reliable disclosure of the Project impact on salinity at CCWD's intakes and other compliance locations, as required by CEQA Guidelines §15384 ("substantial evidence"). This new information must be prepared and circulated for review and comments and must be included in the Final Project EIR/EIS, along with revisions addressing these latest public comments. **R8-18**

2. Disclosure of the Project's impacts on organic carbon concentration is inadequate, misleading, and inaccurate. Estimates of Project impacts on disinfection by-product concentrations at CCWD's drinking water treatment plants is inadequate and subject to large errors **R8-19**

Substantial scientific evidence on organic carbon production in wetlands and in shallow water reservoirs on peat soil were presented in the 1997 State Water Resources Control Board ("Board") Hearing on Delta Wetlands Project Water Rights Applications ("Hearing"). Extensive testimony on the rate of release of organic carbon from Project islands, in particular

on the seasonal variation, quantity, and potential decrease after initial filling were submitted, cross-examined, and accepted into Hearing record. Despite this wealth of information, the Revised Draft EIR/EIS fails to disclose a reliable range of impacts on organic carbon concentration at the intakes and the corresponding increase in disinfection by-products resulting therefrom.

R8-19 cont'd

Extensive evidence has been introduced on the sources of organic carbon in a water storage system such as that on Project reservoir islands. This evidence shows a wide range of organic carbon loading and large seasonal variations. It also shows that, even at a high rate of organic carbon release from the peat soil, the amount of carbon released from the soil is only a small percentage of the carbon content in the top layer of peat soil. This evidence demonstrates that it is highly unlikely that the rate of organic carbon release will decrease appreciably after initial fillings on Project reservoirs. This contradicts one of the key assumptions used in the analysis in the Revised Draft EIR/EIS.

Specifically, the disclosure of organic carbon loading and Project impacts on disinfection by-products in the Revised Draft EIR/EIS is deficient in the following aspects:

- The Revised Draft EIR/EIS fails to disclose the existence of seasonal variation in the rate of release of organic carbon or the effects thereof in its assessment of Project impacts. The analysis erroneously assumes, contrary to substantial evidence, that the rate of carbon release is constant. The Hearing record plainly shows that during some seasons algae and macrophytes in the reservoirs are by far the largest source of dissolved and particulate organic carbon in Project reservoirs. This source is highly seasonal and peaks in the summer, in most years just prior to the time of releases from Project reservoirs. Substantial empirical evidence also establishes that organic carbon release from peat soil increases with temperature, which is highest in the summer. Ignoring these seasonal variations leads directly to significant underestimates of organic carbon concentration in reservoir water at the proposed times of release of water from the reservoir islands. **R8-20**

- The three different organic carbon loading rates (at 1, 4, and 9 gm/m^2/month) analyzed in the Revised Draft EIR/EIS do not adequately represent the full range of loading rates presented in the Hearing. There is substantial evidence that the potential loading rate could be much higher. For example, CCWD Exhibit 10 in the Hearing shows that the averaged rate of organic carbon release from the peat soil alone could be up to 13 gm/m^2/month. CUWA Exhibit 6 discusses that primary productivity of emergent plant communities could be up to 2,250 gm/m^2/year (or an "average" of 188 gm/m^2/month, if seasonal variation is ignored).[2] The highest loading rate analyzed in the Revised Draft EIR/EIS, at 9 **R8-21**

[2] Estimates of organic carbon production in shallow water could be found in most aquatic ecology text books, for example in Tables 7-1 and 7-3 in *Wetlands*, 2nd edition, by Mitsch and Gosselink, 1993. The values reported are similar to those reported in Table 3 in CUWA Exhibit 6 for the Hearing.

gm/m^2/month, could significantly underestimate the actual loading by a factor of 20 or more. In addition, the Revised Draft EIR/EIS limits the 9 gm/m^2/month rate to the initial filling, notwithstanding substantial evidence presented in the Hearing that carbon loading would continue long after the initial filling. **R8-21 cont'd**

- The Revised Draft EIR/EIS fails to accurately disclose the organic carbon loading rates that could be deduced from the "SMARTS" experiments. It misinterprets the experiment set-up and conditions and underestimates the rate of organic carbon loading in a number of ways:
  - The estimates in the Revised Draft EIR/EIS are based on the unsupported and illogical assumption that organic carbon concentration in the tank water will cease to increase after the end of the 12-week-long experiment. This assumption grossly underestimates the rate of organic carbon loading in the experiments. For example, the Revised Draft EIR/EIS erroneously assumes that the total annual organic carbon load from the tanks in "SMARTS 1" would be the same as the load released in the 12-weeks duration of the experiment, in spite of the continuous increase in organic carbon concentration after the 12 weeks reported in a similar but longer duration experiment "SMARTS 2".
  - The Revised Draft EIR/EIS underestimates the rates of organic carbon load that could be estimated from "SMARTS 1". The analysis ignores results from those tanks with higher rates, asserting summarily that "... load estimates obtained from the flushing (flowing water) tanks are questionable" (*page 4-18*). Since sufficient information is available to estimate the uncertainties in the results, the result is that the expected range of organic carbon loading is not fully disclosed. From the results in "SMARTS 1", the District estimates the organic carbon loading rates in the four tanks with stagnant water to be 104, 230, 235, and 136 gm/m^2/year (average 176 gm/m^2/year) and the rates in the tanks with flowing water to be 207, 373, 443, and 202 gm/m^2/year (average 306 gm/m^2/year).[3] That is, the results ignored in the analysis in the Revised EIR/EIS (those from the flowing water tanks) are on average 74% higher than the results used (those from the tanks with stagnant water). Physically, a stagnant water tank would yield a lower carbon load because of the higher organic carbon concentration in its surface water.[4] This results in a smaller concentration gradient between the peat soil and the surface water, and the diffusive flux of organic carbon into the surface water would accordingly be smaller. Because the Project reservoir islands will have much deeper water than the tanks in the "SMARTS" experiments, the organic carbon concentration in the surface water will be lower than those in the "SMARTS 1" tanks (which were as high as 130 mg/L). Thus, the "SMARTS" results from the flowing tanks better reflect the anticipated actual project conditions, and are therefore more appropriate for use in the Revised Draft EIR/EIS. The equivalent range of monthly loads would be 17 – 37 **R8-22**

[3] The Revised Draft EIR/EIS misstates the range to be 24 – 54 gm/m^2/year in *Table 4-5*.
[4] Unlike in tanks with flowing water, organic carbon in the surface water in tanks with stagnant water is not removed..

gm/m^2/month. The largest rate assumed in the Revised Draft EIR/EIS of 9 gm/m^2/month is smaller than the range estimated from "SMARTS 1" by a factor of between 2 and 4. This is hardly the sort of "full disclosure" contemplated by CEQA and NEPA. **R8-22 cont'd**

- As discussed in Sections III.1 and III.2 above, the water quality model (DeltaSOQ) used in the Revised Draft EIR/EIS is incapable of accurately relating the quality of the stored water in Project reservoir islands to Project impacts on water quality at Delta drinking water intakes. These model results underestimate increases in organic carbon and bromide concentrations at these intakes, and consequently underestimate the levels of disinfection by-products estimated from these concentrations.

- The Revised Draft EIR/EIS uses an equation that is not supported by substantial evidence in estimating the total trihalomethanes formed in the water treatment process. This equation underestimates the effects of increasing bromide caused by the Project. This is discussed in more detail in Section III.4 below. **R8-23**

- The Revised Draft EIR/EIS fails to adequately disclose Project impacts on bromate levels at drinking water treatment plants using Delta water. The reason offered in the Revised Draft EIR/EIS for not addressing bromate impacts is unjustified. This is discussed in more detail in Section III.5 below.

Under state and federal law, the Revised Draft EIR/EIS must disclose the full range of Project impacts on organic carbon concentration at Delta municipal intakes that is both verifiable and consistent with current scientific understanding, and which encompasses the Hearing record and other more recent information available. The EIR/EIS must disclose in this fashion the Project impacts (caused by the increase in concentrations of organic carbon and bromide) on increased levels of disinfection by-products. This information must be prepared and circulated for public review and comments and must be included in the Final Project EIR/EIS, along with revisions addressing the latest public comments.

3. Without substantial evidence to support doing so, changes an established mathematical model to estimate Project impacts on total trihalomethane formation. This leads to results of uncertain accuracy and the disclosure on Project impacts is not reliable.

The changes made to the multiple nonlinear regression equation for total trihalomethanes ("TTHMs") production in the Revised Draft EIR/EIS (*Appendix G, pages G-16* to *G-18*) are arbitrary and capricious, for there is neither substantial evidence nor rigorous scientific analysis to justify the changes made in the Revised Draft EIR/EIS. No explanation is given to explain the assumption in the Revised Draft that the "basic chemistry" requires that the TTHMs concentration would only double if the bromide concentration is to increase by **R8-24**

twenty times, from 0.05 mg/L to 1.00 mg/L.[5] The Malcolm-Pirnie equation, which was developed based on rigorous scientific analysis of actual data using scientifically rigorous methods, suggests otherwise. The fact that the established proper THM formula was not even used for comparative purposes, and was instead replaced by an arbitrary equation, falls short of the mandate of "full disclosure", and calls the entire analysis into question.

As the Malcolm-Pirnie equation (*page G-17*) illustrates, TTHM formation depends on a number of factors such as pH, chlorine dose, and temperature in addition to the concentrations of organic carbon and bromide. To properly identify the effects of bromide alone on a single plot of TTHM versus bromide, the values of each of the other factors have to be identical. The Revised Draft EIR/EIS does not disclose whether the data used in *Figure G-10* are all obtained under the same assumed pH, temperature, dissolved organic carbon concentration, chlorine dosage and contact time. If not, the comparisons would be meaningless. The EIR/EIS must clearly disclose the actual values of these factors used in the analysis.[6] **R8-24 cont'd**

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[5] A high bromide concentration has two impacts on TTHMs formation. Firstly, THMs-Br weigh more. Secondly, bromide, when oxidized by chlorine (HOCl) to hypobromous acid (HOBr), can result in the formation of more molecules of THMs than chlorine does. This second effect was not considered in the reasoning in the Revised Draft EIR/EIS.

Trussell and Umphres (in: "The Formation of Trihalomethanes", *Journal of American Water Works Association*, volume 70, part 11, p.604, November 1978) found that the mole-concentration of TTHMs produced per mole of TOC in water chlorinated was related to the ratio of the mole-concentration of bromide incorporated into TTHMs (THM-Br) and the moles of TOC present. They found that the concentration of bromide in the source water influenced the rate of the TTHM reaction as well as the TTHM yield. That is, the rate of TTHM formation was higher in water with a higher bromide concentration.

Amy and colleagues (in: Amy, Gary L.; Lo Tan; & Marshall K. Davis, "The Effects of Ozonation and Activated Carbon Adsorption on Trihalomethane Speciation", *Water Res.*, volume 25, part 2, page 191, February 1991) found that HOCl functions as a more effective oxidant, whereas HOBr behaves as a more efficient halogen substitution agent. They performed THMFP tests and observed that, in general, less than 10% of the HOCl became incorporated into the TTHMs (THM-Cl), whereas as much as 50% or more of the bromide became incorporated into THM-Br. In addition, they found that, as the concentration ratio of bromide to TOC increased, the percentage of other brominated disinfection by-products increased.

[6] Two alternatives are commonly used in assessing the accuracy of a multiple-independent-variables equation (such as the Malcolm-Pirnie equation) using measured data. One approach is to plot the measured value against the predicted value computed from the actual values of the independent variables used in the measurement. The deviation of a data point from a 1:1 line on such a plot would give the discrepancy between the predictive equation and a "perfect correlation". In the case of the Malcolm-Pirnie equation for predicting TTHMs concentration (the predicted value) in chlorinated water, the independent variables are pH, temperature, chlorine dosage and contact time, concentrations of bromide and organic carbon, etc.

Another approach would be to plot the measured value divided by the entire equation except for the part accounting for the dependency of the particular variable of interest against that same variable. For example, to investigate the bromide dependency of TTHMs concentration using the the Malcolm-Pirnie equation, measured values of the variables would be substituted into the expression

$$\{ [\text{TTHM concentration}] / [7.21\ \text{DOC}^{0.004}\ \text{UVA}^{0.534}\ (\text{Cl}_2 - 7.6\ \text{NH}_3 - \text{N}))^{0.224}\ \text{Hours}^{0.255}\ \text{Temp}^{0.48}\ (\text{pH} - 2.6)^{0.719}]\}^{1/2.01} - 1$$

Because of the arbitrary and capricious nature in which changes to established formulae have been made without any justification or supporting evidence, and without disclosing the effects of those changes, the Revised Draft EIR/EIS does not adequately disclose water quality impacts and may in fact be hiding significant impacts. The analysis must be revised and the proper formulae and analyses used and the results must be properly disclosed. The new analysis must be re-circulated for comment. In its present state, the analysis is wholly inadequate and fails to properly disclose important impacts. **R8-24 cont'd**

4. Fails to disclose Project impacts on bromate formation and public health risk

The Revised Draft EIR/EIS fails to meet CEQA and NEPA requirements because it fails to disclose Project impacts on bromate formation in municipal water treatment plants and the resultant public health risk. The Revised Draft EIR/EIS misrepresents the Ozekin equation (*page G-19*) and erroneously rejects its use, even though the Ozekin equation is a widely accepted model currently being used by the U.S. Environmental Protection Agency to develop new drinking water regulations.

The correct form of the Ozekin equation is[7]

$$\text{bromate} = 1.63\ 10^{-6}\ \text{DOC}^{-1.26}\ \text{pH}^{5.82}\ (\text{ozone dose})^{1.57}\ \text{bromide}^{0.73}\ \text{time}^{0.28}$$ **R8-25**

The Revised Draft EIR/EIS (*page G-19*) discloses that it mistook the exponent for the dependency on dissolved organic carbon concentration to be 0.004 (instead of –1.26). The Revised Draft EIR/EIS does not disclose whether the analysis in *Figure G-11* was entirely based on the erroneous equation as written.

As illustrated in the Ozekin equation, bromate formation varies with a number of factors such as pH, ozone dose and contact time, in addition to the concentrations of organic carbon and bromide. In actual practice, the ozone dose applied increases with organic carbon concentration in the source water. Analyses using the Ozekin equation usually assume a linear relationship, such that bromate formation increases with dissolved organic carbon concentration ("DOC") to the one-third power ($\approx \text{DOC}^{-1.26+1.57} = \text{DOC}^{0.31}$).

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which are plotted against the measured values of bromide concentration This would more directly delineate the dependency of TTHMs concentration in chlorinated water on bromide concentration. A similar plot could be made to examine the DOC dependency.

The Revised Draft EIR/EIS, in lieu of using rigorous approaches widely used in scientific analyses, uses an arbitrary and capricious presentation to distort the effects of bromide concentration and DOC concentration on TTHMs formation.

[7] See, for example, Appendix A in "Bay-Delta Water Quality Evaluation" by D.M. Owen, P.A.Daniel, and R.S.Summers, 1998, for a brief discussion of the conditions the equation was derived.

To properly identify the effects of bromide (or DOC) alone on a single plot of bromate versus bromide (or DOC), the values of each of the other factors have to be identical. The Revised Draft EIR/EIS fails to disclose whether the data used in *Figure G-11* was all obtained under the assumed pH and ozone contact time, for example. If not, the comparisons would be meaningless. The EIR/EIS must clearly disclose the actual values of all of these factors used in the analysis. Footnote 6 in this Appendix discusses two accepted approaches for analyzing the relationship between the concentration of a disinfection by-product and bromide or organic carbon concentration.

The Contra Costa Water District and other urban agencies have produced substantial evidence in the Hearing supporting their concerns on Project impacts on bromate formation. The Work Plan for this Revised Draft EIR/EIS explicitly requires revision on the assessment of bromate formation (Water Quality work component 2.2, page 13 of July 16, 1999 SWRCB letter, Harry M. Schueller to Anne J. Schneider, representing Delta Wetlands Properties). The conclusory and unsupported assertion that "... the (Project) effects on bromate concentration are not calculated because no reliable relationship between bromate and DOC or Br could be identified" (*Page 4-30*) fails to conform to the Work Plan, and is not in any way justified. **R8-25 cont'd**

The Revised Draft EIR/EIS is inadequate because it fails to disclose Project impacts on bromate formation and the corresponding public health risk. CEQA and NEPA require that these impacts be disclosed in the Revised Draft EIR/EIS and that a new draft be prepared and re-circulated for public review and comments.

5. Conclusions on the Project's environmental impacts are based on inappropriately large thresholds as the criteria for significant impacts

The Revised Draft EIR/EIS is inadequate in meeting CEQA and NEPA requirements because it uses a set of significance criteria that is so large that it is inconsistent with the purpose and requirements of CEQA and NEPA. The criterion leads to a finding of less-than-significant impact even if the Project would increase a water quality parameter by as large as 20% of an applicable standard, unless the parameter is within 90% of the standard ("20%/90% criterion"). The use of such a large threshold of significance fails to disclose substantial environmental degradation and is in plain violation of applicable federal and state anti-degradation policies. **R8-26**

The discussion in the Revised Draft EIR/EIS in support of the 20%/90% criterion is based on subjective "professional experience" even though the criterion is illogical, unsupported by substantial evidence, and is inconsistent with statutory requirements of CEQA and NEPA. The criterion was purportedly based on the assumption that natural variability in the Delta environment of the water quality variable addressed is 10% of a numerical standard, if

a standard exists, or 10% of the mean value of the variable in the absence of a numerical standard. Measurement errors and modeling uncertainties are likewise assumed to be 10% of the numerical standard, if a standard exists, or 10% of the mean value of the variable in the absence of a numerical standard. The Revised Draft EIR/EIS further assumes that the variability due to simultaneous "natural variability" and "modeling uncertainty" are additive. It then concludes that the threshold of significance is to be 20% of the numerical standard, if a standard exists, or 20% of the mean value of the variable in the absence of a numerical standard.

The District is not aware of any precedent or logic supporting the use of "natural variability" and add to "modeling uncertainties" in determining significance threshold in CEQA or NEPA. Even if there was, the resulting threshold of significance, when evaluated in accordance with substantial evidence, would have been so large as to render the environmental impact analysis meaningless.

Historical data discussed in Chapter 4 of the Revised Draft EIR/EIS (*page 4-8* to *4-16*) demonstrates that the "natural variability" in the Delta environment is much greater than the 10% assumed. All the water quality parameters presented in that chapter (EC at various stations, TOC, chloride) have a "natural variability" of at least 50%. Moreover, Appendix G of the Revised Draft EIR/EIS shows that the water quality model used in the analysis (DeltaSOQ) also has an error ("modeling uncertainty") much larger than 10%. Section III.2 in this Appendix shows that this modeling uncertainty is 40% or more for salinity at Chipps Island. Adding the values of the "natural variability" and "modeling uncertainty" that are supported by substantial evidence would lead to a threshold for significance of 90%, which would plainly render any environmental impact analysis meaningless and is clearly inconsistent with the purpose of CEQA and NEPA.[8] **R8-26 cont'd**

The Public Resources Code of the State of California, §21068, defines a "significant effect on the environment" as "substantial, or potentially substantial, adverse change in the environment." CEQA Guidelines §15384 define "substantial evidence" as "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion... *Argument, speculation, unsubstantiated opinion* or *narrative, evidence which is clearly erroneous or inaccurate*, or evidence of social or economic impacts which do not contribute to or are not caused by physical impacts on the environment does not constitute substantial evidence" [emphasis added]. CEQA Guidelines §15064.7 defines threshold of significance as "...an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant. ... Threshold of significance to be

[8] The large modeling inaccuracy in this case points to the need to develop more accurate models for determining environmental impacts. Modeling errors must not be used as an excuse to increase the magnitude of the significance criteria threshhold and thereby hiding the actual impacts of a project.

adopted for general use ... must be adopted by ordinance, resolution, rule, or regulation, and developed through a public review process and be supported by substantial evidence." The 1997 Hearing provided an appropriate public process for the development of such a significance criterion. Both CCWD and CUWA submitted substantial evidence supporting a significance criterion of 5% change, or less. The Revised Draft EIR/EIS simply ignores this information, despite the directive in the Work Plan to describe such information.

The District has also submitted testimony in the 1997 Hearing that the EIR/EIS must assess Project impacts on the District's delivered water quality goal. This water quality objective is discussed in more detail in the following section. In a separate water rights hearing, the District submitted to the SWRCB substantial evidence[9] amply documenting the significant adverse impacts on the District caused by an increase of 5 mg/L of CCWD's delivered water goal of 65 mg/L chloride. (CCWD respectfully requests that the lead agencies take official notice of that evidence, additional copies of which will be furnished upon request.) This impact is less than 8% of the delivered water goal and much less than (about one-tenth of) the 20% significance criterion used in the Revised Draft EIR/EIS. For comparison purpose, a 5 mg/L chloride impact would be only 2% of the 250 mg/L chloride standard used in the Revised Draft EIR/EIS for salinity impact analysis. Despite that much smaller threshold, a project that causes a 5 mg/L chloride increase would significantly impair the operation of the Los Vaqueros Project and impair the benefits of the Los Vaqueros Project to CCWD and the Delta ecosystem. As is described more fully in the referenced evidence, the adverse impacts on CCWD include reduced emergency water supply reliability, degraded delivered water quality, reduced fishery benefits, reduced operational benefits to CVP, and impaired recreational value. A threshold of significance of 20% of the 250 mg/L chloride standard is clearly inappropriate for the "full disclosure" required of environmental impact analysis. **R8-26 cont'd**

New Project impacts analyses based on a set of much smaller significance criteria that is consistent with CEQA and NEPA requirements must be prepared and circulated for public review and comments. These analyses must be included in the Final Project EIR/EIS, along with revisions addressing the latest public comments.

6. <u>The Revised Draft EIR/EIS fails to disclose Project impacts on the District's Los Vaqueros Project and the District's water quality goal of 65 mg/L chloride for delivered water</u>

In May 1987, CCWD's Board of Directors adopted water quality objectives of 65 mg/L chloride and 50 mg/L sodium for water distributed within its service area. In 1988, the voters in the District's service area approved funding for the Los Vaqueros Project to meet

[9] In: CCWD Exhibit-3, titled "The impacts of increased Delta salinity on Contra Costa Water District and the performance of CCWD's Los Vaqueros Project", Expert Testimony of William J. Hasencamp before the State Water Resources Control Board, State of California, in Phase 5 "The responsibilities for meeting the dissolved oxygen and southern Delta salinity objectives" in the Bay-Delta Water Rights Hearing commencing July 1, 1998.

these water quality objectives. The Los Vaqueros Project has been completed and in full operation since 1998.

The need to improve water quality is clearly stated in the Los Vaqueros Project EIR/EIS[10]. The Los Vaqueros EIR/EIS states that:

> It may be difficult to meet primary drinking water standards expected to be established by the U.S. Environmental Protection Agency in the near future without modifying CCWD's treatment processes. Necessary equipment modifications to meet anticipated primary drinking water standards are being planned at CCWD's existing water treatment plant and are being incorporated into the construction of the Randall-Bold Water Treatment Plant.
>
> CCWD's conventional water treatment processes, however, do not lower the concentration of parameters for which secondary standards exist, such as sodium, chloride, total dissolved solids, and water hardness. These parameters diminish the overall water quality delivered to municipal customers and industry. Existing secondary standards for chloride and TDS sometimes cannot be met with the present CCWD system, particularly during critical years. Levels of sodium and water hardness, and associated health risks to some individuals, also can be high during periods of water quality degradation.

Both the Randall-Bold Water Treatment Plant and the Los Vaqueros Project have been completed and are in operation. In addition, the District has recently completed an extensive improvement project at the Bollman Water Treatment Plant with the conversion to ozonation.

The District has invested heavily in improving the water quality of its water supply. The financial burden the District and its 430,000 customers assume in committing to these investments are based on the premise that source water quality from the Delta will be protected from degradation that would reduce or erase the benefits of these heavy investments.[11] The District and its customers look towards state and federal agencies to uphold the statutory environmental protection provided for in CEQA and NEPA and the water quality protections provided for in the state and federal anti-degradation statutes. CEQA and NEPA compliance documents for projects that could degrade CCWD's source water supply must fully disclose the projects' potential impacts on CCWD's ability to meet its water quality goals.

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[10] Pages 1-1 *et seq* in Final Stage 2 Environmental Impact Report/Environmental Impact Statement for the Los Vaqueros Project SCH#91063072, Volume I, September 1993.

[11] Policy statement of Walter J. Bishop, General Manager of CCWD, in the 1997 Water Rights Hearing, in particular Hearing Transcript p.1323 *et seq*.

The Revised Draft EIR/EIS is inadequate because it fails to fairly and fully disclose the impacts of the proposed Delta Wetlands Project on CCWD's ability to meet its water quality goals. The Revised Draft EIR/EIS must be further revised to incorporate a detailed analysis of the Project impacts on the water quality at CCWD's Rock Slough and Old River intakes. These impacts must be identified at those sites rather than being masked as an "averaged" "export chloride" impact. The impacts in water quality in CCWD's Los Vaqueros Reservoir and the quality of water delivered to CCWD's service area must be disclosed. The revised EIR/EIS must be re-circulated for public review and comments. **R8-27**

8. The Revised Draft EIR/EIS fails to document and justify substantial changes in an established model for predicting salinity in the Delta. This leads to results and conclusions on Project impacts that are unreliable

The Revised Draft EIR/EIS (*page G-9*) describes the DeltaSOQ calculations for salinity intrusion. These are stated as "using the Contra Costa Water District (CCWD) methodology". This statement is factually incorrect. The "CCWD methodology," more commonly referred to as the "antecedent outflow-salinity model" (or the "G-Model"), is used by CCWD in determining electrical conductivity ("EC") in western Delta and chloride concentration in Rock Slough due to seawater intrusion. This G-Model has been calibrated and verified with extensive historical data.

The component in the DeltaSOQ model used in the Revised Draft EIR/EIS that corresponds to this G-Model has been substantially altered, eliminating entirely the time it takes for the chloride concentration at Rock Slough to respond to changes in Delta outflow. For example, the 14-days time delay used in the G-Model (between changes in salinity at Jersey Point and Rock Slough), is assumed to be 0 days in the DeltaSOQ model. In other words, the DeltaSOQ model erroneously assumes that salinity in Rock Slough responds instantaneously to salinity change in Jersey Point, which is physically impossible. This fundamental alteration of the G-Model is contrary to the basic physical processes governing flow and salinity transport in the Delta. This single assumption causes modeled water quality impacts at Rock Slough to occur too early. The Revised Draft EIR/EIS fails to present any reason or any substantial evidence to support the change. **R8-28**

The Revised Draft EIR/EIS also fails to provide any substantial evidence to support using substantially different coefficients in the equations for predicting EC at Jersey Point and chloride concentration at Rock Slough. The coefficients used in the Revised Draft EIR/EIS *page G-9* to *G-10*) are substantially different from those in the 1995 Draft EIR/EIS (see pages B2-14 and B2-15 of the 1995 Draft EIR/EIS). A key coefficient in the DeltaSOQ equation for effective outflow is changed from 5,000 to 6,600 (a 32 percent increase) without any supporting evidence.

The Revised Draft EIR/EIS is inadequate because it fails to disclose the reason for the modifications to this aspect of the G-Model, which is critical to estimating EC at Jersey Point and chloride concentration at Rock Slough. Accurate estimates of the salinity at these locations are essential to accurately estimating and meaningfully disclosing Project impacts. The Revised Draft EIR/EIS must be further revised to provide accurate predictions of the salinity at these two key locations using a valid calibrated model verified by substantial evidence. The District requests that the G-Model be used as is and without unjustified and unexplained changes. If the modified salinity-outflow model continues to be used, the results using both the G-Model and the modified model must be disclosed and compared to allow full disclosure of the impacts of the modifications. The model results must be fairly disclosed and circulated for public review and comments and must be included in the Final Project EIR/EIS, along with revisions addressing the latest public comments. **R8-28 cont'd**

IV. DEFICIENCIES IN THE ANALYSIS AND SCOPE OF THE REVISED DRAFT EIR/EIS

The Revised Draft EIR/EIS is inadequate in meeting CEQA and NEPA requirements because it fails to disclose a number of significant environmental impacts of the proposed Project. An EIR/EIS must identify and focus on the possible significant environmental impacts of a proposed project [Pub. Res. Code § 21000(a); Title 14, Cal. Code Regs. ("Guidelines") § 15126]. The analysis should clearly identify direct and indirect impacts in the short-term and in the long-term. "While foreseeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can" [Guidelines § 15144]. The Revised Draft EIR/EIS for the Delta Wetlands Project fails to meet these requirements.

A. Unavoidable Significant Impacts

R8-29

An EIR must identify any significant impacts that cannot be avoided if the project is implemented, including those that can be mitigated but not reduced to a level of insignificance [Pub. Res. Code § 21100(b); Guidelines § 15126(b)]. Where the only means of avoiding such impacts would be to impose an alternative design on a proposed project, but the lead agency nevertheless decides not to require such design changes, the EIR must describe the implications of impacts involved and the agency's reasons for choosing to tolerate them rather than requiring the alternative design [Guidelines § 15126(b); Pub. Res. Code § 21000(b)]. The Revised Draft EIR/EIS fails to meet these requirements.

Section II of this Appendix gives a detailed discussion on the significant impacts of the proposed Project. Section III gives a detailed discussion on the methodological deficiencies in the Revised Draft EIR/EIS. The District requests that a revised EIR/EIS be prepared to address these comments in detail and re-circulated for review.

B. Increased risks to public health

An EIR must fully describe the impacts on public health, if any, of the proposed project. CEQA Guidelines 15065(d) provides for a mandatory finding of significance if a project will cause substantial adverse effects on human beings, either directly or indirectly. If the proposed project does substantially increase health risk, the reasons that the proposed project is believed by its proponent to be justified for immediate implementation should be explained [Guidelines § 15126(e)]. **R8-30**

Sections II and III of this Appendix give detailed discussions on the failure of the Revised Draft EIR/EIS to adequately disclose the Project impacts on the acute and chronic public health risks health effects of increased disinfection by-products in drinking water supplies. The Revised Draft EIR/EIS also fails to explain the reasons why immediate implementation of the Project is justified in light of such potential health risks. The District requests that a revised EIR/EIS be prepared to address these comments in detail and re-circulated for review.

C. Significant cumulative impacts.

An EIR must identify and discuss significant cumulative impacts [Guidelines §15130(a)]. Cumulative impacts are those that are "individually limited but cumulatively considerable" [Pub. Res. Code §21083(b)]. The cumulative impact analysis must contain three elements. First, it must identify related projects through the use of either a project list or a projection approach [Guidelines §15130(b)(1)]. Second, it must contain a summary of the expected environmental effects to be produced by related projects [Guidelines §15130(b)(2)]. Finally, it must contain a reasonable analysis of the cumulative impacts of the related projects and an examination of reasonable options for mitigation measures for a proposed project [Guidelines § 15130(b)(3)]. **R8-31**

The Revised Draft EIR/EIS fails to adequately discuss the cumulative impacts of the proposed Project in combination with other reasonably foreseeable Projects in the Delta, as discussed above. An additional required analysis is how the proposed Project might be coordinated operationally with the Los Vaqueros Project, as well as an analysis of the environmental impacts of such operations. Salinity increases at the District's intakes should be examined in conjunction with impacts from other proposed projects that may also cause elevated salinity and organic carbon concentration in parts of the Delta. A revised EIR/EIS must be prepared to address these comments in detail and re-circulated for public review and comments..

D. The EIR/EIS fails to adopt legally adequate mitigation measures

An EIR must identify mitigation measures that could minimize each significant environmental effect [Guidelines § 15126(c)]. Where several mitigation measures are available, each should **R8-32**

be discussed and the basis for selection of a particular measure identified [*Id.*].

The Revised Draft EIR/EIS fails to identify mitigation measures that are adequate to minimize the significant impacts of the Project on Delta water quality, as discussed above. The Revised Draft EIR/EIS must contain detailed mitigation measures and outline an implementation plan to ensure that the diversions to, operations of, and discharges from, Delta Wetlands Project islands do not significantly affect concentrations of organic constituents and potential contaminants in ambient Delta channels or at the Delta intakes and export pumps. This will also help to ensure that Project diversion, operations, and discharges do not impair beneficial uses of the water, injure lawful users of water, or cause unacceptable adverse impacts on municipal water supplies or other beneficial uses. The District requests that a revised EIR/EIS be prepared to address these comments in detail and re-circulated for public review and comments. **R8-32 cont'd**

V. Adverse impacts to CCWD caused by increased salinity and concentrations of organic carbon and other constituents of concern at CCWD's intakes

As more fully described in the material of which official notice is requested, higher salinity adversely impacts on the District's municipal and industrial water supply and the District's customers in the following ways:

- Increased salinity (quantified as total dissolved solids, chloride, bromide, and sodium concentrations) will impact industrial and municipal uses by increasing corrosion and causing health problems. Increased salinity in source water also reduces the potential and feasibility of recycling (water reuse) and conjunctive uses.

- A higher bromide in source water leads to higher disinfection by-products such as bromate and brominated trihalomethanes, makes it more difficult for urban agencies to meet increasingly stringent drinking water regulations and increases health risk.

- A higher salinity at CCWD's intakes reduces the performance of the Los Vaqueros Project by decreasing the frequency CCWD could meet its delivered water salinity goal and by increasing the pumping cost associated with replenishing blending water releases from the Reservoir. The water quality goal of CCWD's $450,000,000 Los Vaqueros Project is to provide its customers with a delivered water quality of 65 mg/L chloride or less. The Los Vaqueros Project improves the quality of CCWD's water supply by storing high quality Delta water (typically water with a chloride concentration of less than 50 mg/L), when it is available, in the Los Vaqueros Reservoir for blending with Delta diversions later on when salinity in Delta water is high. The Los Vaqueros Project also includes a new Delta intake, at Old River south of Broden Highway (State Route 4), which usually has a better water quality

than CCWD's existing intake at Rock Slough. A higher salinity in the Delta will decrease the amount of water available for storage in the Los Vaqueros Reservoir and increase the salinity of both the stored water and water diverted directly from the Delta.

As more fully described in the material of which official notice is requested, increases in organic carbon concentration at CCWD's intake adversely impacts the District's municipal water supply and the District's customers in the following ways:

- A higher particulate and dissolved organic carbon concentration in the source water requires a higher disinfectant (ozone) dosage and increases treatment cost.

- A higher ozone dosage also increases the level of disinfection by-products such as bromate in the treated water, increases health risk to the public, and makes it more difficult to comply with existing and future drinking water regulations. This impact could be further aggravated by a simultaneous increase in bromide level caused by salinity increase.

- Increased organic carbon level increases formation of disinfection by-products such as trihalomethanes and haloacetic acids during chlorination and chloramination, increases health risk to the public, and makes it more difficult to comply with existing and future drinking water regulations.

As more fully described in the material of which official notice is requested, increases in pathogens and other water quality constituents of concern at CCWD's intake adversely impacts the District's municipal water supply and the District's customers in the following ways:

- Higher pathogens level (in particular protozoan such as *Cryptosporidium parvum* and *Giardia lamblia*) in the source water requires a higher level of disinfection. This leads to higher disinfection by-products concentrations, increases public health risk, and makes it more difficult to comply with existing and future drinking water regulations. It also increases treatment cost.

- Higher concentrations of pesticides, heavy metals, and other toxins could lead to exceedance of national drinking water standards for primary pollutants. The number of regulated pollutants has been increasing steadily in the past thirty years and will increase further under the recently re-authorized federal Safe Drinking Water Act.

California water users have expended a great deal of effort to develop programs for improving water quality in the Delta. Contra Costa Water District, in collaboration with a number of urban water agencies, has been an active participant in the development and implementation of the Bay-Delta Accord, implementation of the Central Valley Project Improvement Act, and the CALFED Bay-Delta Program. CCWD has contributed both funding and in-kind services to stop

degradation of Delta water quality and improve conditions in the Delta. Source control is one of the critical elements in all of these efforts. Potential degradation of Delta water quality, if left unmitigated, will significantly reduce the benefits or nullify these efforts which have been made at significant costs.

Appendix B

Summary list of additional information that must be included in the Project EIR/EIS

CCWD has identified a number of cases where the Revised Draft EIR/EIS is inadequate and the Draft EIR/EIS will need to be further revised and recirculated for public comment and review. This appendix is intended to assist the lead agencies in this process by summarizing the key requested revisions. More details are given in Appendix A.

1. Detailed analysis of monthly impacts at CCWD's intakes, other municipal water supply intakes and compliance locations using a validated Delta hydrodynamic and salinity model, such as the Fischer Delta Model, to provide detailed reliable disclosure of the Project impacts on salinity at these locations. Data should be disclosed as absolute monthly chlorides or EC and the corresponding changes from the existing No-Project base case.

2. Reanalyse water quality impacts in the Central and South Delta and disclose the different impacts at individual urban Delta drinking water intakes such as the State Water Project ("SWP") intake at Clifton Court Forebay, Central Valley Project ("CVP") intake at Tracy Pumping Plant, and CCWD's intakes at Rock Slough and Old River. The present model DeltaSOQ is grossly inadequate because it only presents a single combined Central Delta chloride concentration. The CALFED Bay-Delta Program, Department of Interior CVPIA, CCWD Los Vaqueros Project and other Bay-Delta environmental documents have all provided and disclosed water quality impacts with this required level of geographic detail in the South and Central Delta. Data should be disclosed as absolute monthly chlorides or EC and the corresponding changes from the existing No-Project base case for each intake location. **R8-33**

3. Use of a 5% significance criterion for Project impacts on the water quality parameters of concern, including, but not limited to, salinity (quantified as electrical conductivity and chloride and bromide concentration) and concentrations of organic carbon (both dissolved and particulate) and disinfection by-products (bromate, trihalomethanes, haloacetic acids, etc.). If other significance thresholds are also used, data must be disclosed that indicates the effects of choosing different thresholds on the impact analysis conclusions.

4. Reanalysis of Delta Wetlands operations which include of operations criteria that delay reservoir island filling after the first winter storms to eliminate the effects of increased seawater intrusion on Delta drinking water intakes and ensure only the highest quality water is diverted onto the islands. Such criteria could be based on based on criteria such as higher minimum Delta outflow threshold, and/or lower maximum X2 location and chloride concentration criteria at urban intakes. Data should be provided that clearly discloses the reduction in adverse water quality impacts, and water supply impact on Delta Wetlands, if any, when these mitigation measures are implemented.

5. Reanalysis of organic carbon impacts based on a more realistic range of organic carbon concentration in Project stored water, taking into account seasonable variations in organic carbon input, and incorporating important information from the SMARTS flowing water tests.

6. Reanalysis of future cumulative impacts of the Delta Wetlands Project which includes are more complete combination of future Bay-Delta Projects, including those being developed by the CALFED Bay-Delta Program, taking into account future Total Maximum Daily Load limits as required for impaired waterways such as the Delta.

7. Reanalysis of water quality impacts in terms of CCWD's ability to meet its 65 mg/L delivered chloride goal. Data should disclose monthly water quality at CCWD's Rock Slough and Old River intakes plus the corresponding Los Vaqueros Reservoir operations and changes in CCWD delivered chloride concentrations.

R8-33 cont'd

8. Reanalysis using the original scientifically-derived and peer-reviewed multiple nonlinear regression equation for total trihalomethanes ("TTHMs") rather than an arbitrarily modified version of the Malcolm-Pirnie model.

9. Analysis of the Project impacts on the formation of bromate water treatment plants as previously proposed in the work plan for the Revised Draft EIR/EIS, using the widely-accepted Ozekin model which is currently being used by the U.S. Environmental Protection Agency to develop new drinking water regulations. Data must be provided for bromate production with at least the same level of detail as THM production data, including detail for each of the urban drinking water intakes in the South and Central Delta.

10. Reanalysis using Contra Costa Water District's (CCWD) original salinity-outflow (G-Model) methodology. If the modified but significantly different model continues to be used, detailed disclosures of the reasons for the modifications and a detailed comparison of the differences in calculated impacts using both methods must be given. The reasons for changing the equation coefficients between the 1995 Draft and the Revised Draft must also be disclosed.

11. Full disclosure of Project impacts on the acute and chronic public health risks health effects of increased disinfection by-products in drinking water supplies.

12. Development of mitigation measures and outlining an adequate implementation plan regarding the water quality impacts of the Project.

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Subject: CCWD Comment Letter dated July 31, 2000 on the Revised Draft Environmental Impact Report/Environmental Impact Statement for the Delta Wetlands Project

Dear Mr. Sutton and Mr. Finan:

The Contra Costa Water District ("District") has identified a couple of typographic errors in its July 31, 2000 comment letter on the Revised Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project. These errors are minor and do not materially affect the substance of the District's comments:

- Issues III.3 through III.7 in Appendix A (pages A-11 to A-21) were mislabeled as III.2 through III.6. Two separate issues were labeled as III.2. The second one should have been III.3. Similarly, the issue labeled as III.3 should have been III.4, III.4 should have been III.5, III.5 should have been III.6, and III.6 should have been III.7. **R8-34**
- Discussion on the proposed project's impacts on the levels of disinfection by-products was misprinted as "acute and chronic public health risks health effects". Please delete "health effects" from the phrase in IV.B in Appendix A (page A-23) and item 11 in Appendix B (page B-2). This should have read "acute and chronic public health risks".

If you have any questions, please contact me at (925) 688-8187.

Sincerely,

Richard A. Denton
Water Resources Manager

Delta Wetlands file

cc: City of Antioch
California Urban Water Agencies
Delta Wetlands Properties

Contra Costa Water District

R8-1. Previous CCWD comments were reviewed carefully during preparation of the 2000 REIR/EIS. CCWD comments provided some of the most useful feedback on the 1995 DEIR/EIS. See responses to Comment Letter C9.

R8-2. This comment summarizes several concerns:

increased salinity at CCWD intakes;

elevated levels of DOC, algae, salts, and possibly other contaminants in Delta Wetlands discharges;

project effects on DBPs; and

the impairment of Los Vaqueros Project operations.

These concerns are addressed in responses to specific comments that follow.

These issues are also the basis of the terms of the protest dismissal agreement between Delta Wetlands and CCWD. See response to Comment C9-1.

R8-3. The concerns about the methods used in the 2000 REIR/EIS to evaluate project effects on salinity, DOC, THM, and bromate that are summarized in this comment are addressed in responses to specific comments that follow.

R8-4. The mitigation recommended in the 1995 DEIR/EIS and 2000 REIR/EIS is designed to accommodate the uncertainty about the effects of the project on salinity and DOC. These mitigation measures are enforceable through the permit terms and conditions issued by the SWRCB and USACE. The mitigation measures require Delta Wetlands to monitor water quality parameters in Delta channels, on the Delta Wetlands Project islands, and at the export locations; this information would be used to calculate the expected effect of Delta Wetlands operations on export water quality. Delta Wetlands operations would then be reduced and/or delayed to minimize effects on concentrations of export DOC and salinity. Thus, the mitigation is designed to be effective regardless of the actual increases in salinity and DOC concentrations observed under project implementation.

The Delta Wetlands Project WQMP uses a similar combination of monitoring, modeling of expected impacts, and modifications of project operations to mitigate project impacts on water quality. The WQMP and the protest dismissal agreement between CCWD and Delta Wetlands specifies water quality monitoring, modeling, and operational controls that would protect drinking water quality as well as or better than the mitigation measures in the NEPA and CEQA analysis. For more details, see Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts"; response to Comment

C9-1; and the Delta Wetlands–CCWD protest dismissal agreement (included in the Appendix to the Responses to Comments).

R8-5. See response to Comment R4-14 regarding recirculation of the 2000 REIR/EIS. Responses to specific comments from CCWD are provided below.

R8-6. See responses to CCWD's specific comments on the impact analysis methodology below. Additionally, Master Response 6, "Significance Criteria Used for the Water Quality Impact Analysis", and Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", provide more information about the significance criteria used in the analysis and project effects on DBPs, respectively.

R8-7. See response to Comment R8-4 regarding the mitigation measures recommended in the 2000 REIR/EIS. The 2000 REIR/EIS reevaluated project effects with incorporation of the FOC restrictions on project operations. Incorporating the FOC restrictions reduces project impacts on salinity. The commenter is correct in noting that project operations would be further modified if the recommended mitigation measures for water quality effects were implemented; however, implementing those measures would not result in the identification of new, significant environmental impacts. Therefore, no additional analysis is required.

R8-8. See response to Comment C9-52 regarding the cumulative water quality impact analysis.

R8-9. See response to Comment R4-14 regarding recirculation of the 2000 REIR/EIS; see response to Comment R8-7 regarding evaluation of mitigated project operations.

R8-10. Many of the statements made in this comment are similar to comments received on the 1995 DEIR/EIS from CCWD; see also responses to Comment Letter C9. Specifically, see responses to Comments C9-17 and C9-22 regarding restrictions on Delta Wetlands' operations adopted as part of the Delta Wetlands–CCWD protest dismissal agreement and the FOC, respectively. These restrictions minimize potential project effects on salinity.

CCWD suggests that a 5% change be used for the significance criteria rather than the 20% used in the NEPA and CEQA analysis. This disagreement over the selected significance criteria is not a fundamental flaw of the analysis. See Master Response 6, "Significance Criteria Used for the Water Quality Impact Analysis", for a discussion of the application of the significance criteria used in the 1995 DEIR/EIS and the 2000 REIR/EIS analysis.

CEQA and NEPA do not require the use of the most complex or detailed model available for impact analysis. Monthly modeling of Delta flows and corresponding salinity patterns is the currently accepted method for planning studies and environmental assessments; this monthly modeling approach was used for the Delta Wetlands Project impact assessment. The 2000 REIR/EIS disclosed the impacts of Delta Wetlands diversions on salinity. See also response to Comment C9-12 regarding the WQMP modeling assumptions to which Delta Wetlands and CUWA have agreed; these include use of the FDM Version 10 with simulations of daily tides.

The use of a representative Delta export location in the DeltaSOQ model is discussed in detail in response to Comment C9-12. The 2000 REIR/EIS reported changes in chloride concentrations in the south Delta exports (see Table 4-19 in the 2000 REIR/EIS [Table 3C-27 in Chapter 3C of FEIS Volume 1]). The analysis cannot speculate on how CCWD would change its operations or apply its operating rules for Los Vaqueros Reservoir in response to changes in Delta conditions; however, CCWD can use this information to estimate the subsequent effects on the operations of Los Vaqueros Reservoir and the Contra Costa Canal. The protest dismissal agreement between Delta Wetlands and CCWD addressed CCWD's concerns about the project's potential effects on Los Vaqueros Reservoir operations.

CCWD also suggests that if Delta Wetlands waits until salinity is reduced before it begins diversions, the potential salinity effects would be greatly reduced during subsequent Delta Wetlands discharge periods. The FOC measures do require that the X2 location be at or downstream of Chipps Island before Delta Wetlands begins diversions. The 2000 REIR/EIS indicated that these FOC measures have substantially reduced the potential effects of Delta Wetlands diversions on salinity (see pages 3C-76 and 3C-77 in Chapter 3C of FEIS Volume 1; see also response to Comment C9-22).

Additionally, the salinity impact analysis assumed that the salinity of water diverted onto the Delta Wetlands islands was equal to the previous month's export salinity. This is a conservative assumption; the salinity of water diverted onto the Delta Wetlands reservoir islands during actual project operations may be less than that modeled for the impact analysis (see Comment R10-7).

Finally, the protest dismissal agreement between CCWD and Delta Wetlands includes additional restrictions on Delta Wetlands diversions to minimize project effects on salinity; for more information, see response to Comment C9-17 and the protest dismissal agreement contained in the Appendix to the Responses to Comments. The FOC and the WQMP provide more than adequate protection for salinity in CCWD diversions.

R8-11. See response to Comment R4-8 regarding the range of DOC loading rates estimated in the analysis. See response to Comment C9-12 regarding the evaluation of project effects on salinity. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", regarding the evaluation of project effects on DBPs and mitigation measures proposed to address those effects. See also responses to CCWD's Comment Letter C9 on the 1995 DEIR/EIS.

R8-12. See response to Comment C9-52 regarding the cumulative water quality impact analysis.

R8-13. The use of a representative Delta export location in the DeltaSOQ model is discussed in detail in response to Comment C9-12. See responses to Comments C9-12 and R8-10 regarding the use of the FDM for impact analysis and during project operations. There is no need to recirculate the 2000 REIR/EIS; see response to Comment R4-14.

R8-14. The simulated No-Project Alternative serves as the baseline condition with which simulated Delta Wetlands Project operations are compared for impact assessment purposes. Although DeltaSOQ cannot replicate all the complex changes in water quality that occur in the Delta, the DeltaSOQ results are generally confirmed by the historical EC and chloride measurements. See response to Comment C9-13 for a detailed discussion of the relationship between simulated water quality and historical values.

R8-15. The commenter seems to be confusing the monthly simulations with actual project operations. The monthly simulations are used in the NEPA and CEQA analysis to determine the potential for project impacts on salinity; in actual (real-time) project operations, mitigation would be triggered if operations caused an impact on water quality. The commenter states that the monthly model considerably underpredicts salinity, resulting in unaccounted adverse effects during project operations. However, the mitigation measures require Delta Wetlands to monitor water quality parameters in Delta channels, on the project islands, and at the export locations before and during project operations. This information would be used to calculate the real-time effect of Delta Wetlands operations on salinity. The Delta Wetlands–CCWD protest dismissal agreement and the WQMP provide additional details about the way that coordinated project scheduling, modeling, monitoring, and operational constraints would be used to track short-term and long-term project effects on water quality. See also response to Comment R8-4 above.

R8-16. The commenter argues that DeltaSOQ calculations of improvements in export chloride during periods of Delta Wetlands Project diversions are erroneous and that the result shown for January 1981, in particular, "defies reason".

In the example month (January 1981), project diversions were simulated to be 3,871 cfs. The export chloride simulated for no-project conditions was 50 mg/l, and the chloride concentration was simulated to improve by 12.5 mg/l under project operations to 37.5 mg/l.

Project diversions would always reduce Delta outflow, and the reduction in outflow would always increase the seawater intrusion at Chipps Island and Jersey Point, at least slightly. In some cases when the project is simulated to be diverting, however, outflow remains high enough to prevent seawater intrusion from causing any measurable effect at Jersey Point. The following table summarizes for the example month the DeltaSOQ-simulated reduction in Delta outflow and the corresponding increase in EC at Chipps Island. Although Chipps Island EC increased, the simulated chloride concentration at Jersey Point changed by less than 1 mg/l.

Project Effects on Outflow and Seawater Intrusion
with Project Diversions of 3,871 cfs

	No-Project	With Project	
Affected variable	Simulated amount	Simulated amount	Description
Delta outflow	26,951 cfs	23,080 cfs	Reduced by Delta Wetlands Project diversions
Chipps Island EC	194 FS/cm	270 FS/cm	Increased by reduction in outflow
Jersey Point chloride	8 mg/l	8 mg/l	Remained the same because outflow was still sufficient to prevent measurable seawater intrusion

The salinity of water that enters the Delta from different sources can vary considerably. The salinity of exported water therefore depends on the relative contribution of each source to the total volume of exports. The sources of water for diversion or export are the western Delta and Sacramento River inflow, agricultural drainage, and San Joaquin River inflow. The salinity of agricultural drainage and San Joaquin River inflow is generally higher than that of water from the western Delta/Sacramento River. DeltaSOQ calculates the fraction of these water sources that will be exported or diverted or that will be discharged (i.e., as QWEST) from the south Delta.

Project diversions may include agricultural drainage and San Joaquin River inflow. If these sources have higher salinity than western Delta/Sacramento River water and if the volume diverted onto the project islands is great enough, the water reaching the export locations will consist of smaller proportions from these sources. Consequently, water from the western Delta and Sacramento River will make up a greater proportion of exports. Such a shift in source contributions to exports for January 1981 is shown in the following table.

In this simulation, a greater proportion of exports consists of western Delta/Sacramento River water during project diversions than under no-project conditions, and this source has much lower salinity than agricultural drainage and San Joaquin River inflow. Therefore, the project-related change in the proportions of export water that originate from the different sources results in improved salinity of exports.

Effects of the Delta Wetlands Project on Exports
with Project Diversions of 3,871 cfs

	No-Project (Exports = 5,720 cfs; QWEST = 2,567 cfs)		With Project	
Export component	Export fraction	Salinity of fraction	Export fraction	Salinity of fraction
Agricultural drainage (125 mg/l chloride) —1,067 cfs	13%	125 mg/l x 0.13 = 16 mg/l	11%	125 mg/l x 0.11 = 14 mg/l
San Joaquin River inflow (103 mg/l chloride) —2,244 cfs	29%	103 mg/l x 0.29 = 30 mg/l	17%	103 mg/l x 0.17 = 18 mg/l
Western Delta and Sacramento River inflow (8 mg/l chloride)	58%	8 mg/l x 0.58 = 4 mg/l	72%	8 mg/l x 0.72 = 6 mg/l
Total exports	100%	50 mg/l	100%	38 mg/l

The simulated reduction in export salinity in June and July 1985 was the result of the salinity of Delta Wetlands discharges being lower than no-project salinity. Discharges for export are shown in Tables 3-15 and 3-18 of the 2000 REIR/EIS (Tables 3A-34 and 3A-37, respectively, in Chapter 3A of FEIS Volume 1); the tables referred to by the commenter show Delta Wetlands storage amounts, not discharges. The analysis of project effects on water quality in Chapter 4 of the 2000 REIR/EIS was based on the scenario in which discharges for export are limited by south-of-Delta delivery deficits (Table 3-18 [FEIS Volume 1, Table 3A-37]).

R8-17. CCWD's goal of delivering water with less than 65 mg/l chloride is not a prevailing standard or water quality objective for the Delta. The analysis of Delta Wetlands Project effects on salinity appropriately uses significance criteria that are based on existing standards, rather than CCWD's goal. The established 1995 WQCP chloride objectives are 150 mg/l and 250 mg/l (depending on the water-year type).

The water right protest dismissal agreement that Delta Wetlands and CCWD submitted to the SWRCB addresses CCWD's remaining concerns about potential project effects on the quality of water available for diversion by CCWD and Los Vaqueros Reservoir operations. See response to Comment C9-17.

R8-18. See responses to Comments C9-12 and R8-10 regarding use of the FDM; see response to Comment R4-14 regarding recirculation of the 2000 REIR/EIS.

R8-19. See response to Comment R4-8 regarding the range of DOC loading estimated in the analysis. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", regarding the evaluation of project effects on DBPs and mitigation measures proposed to address those effects.

R8-20. See response to Comment R4-8.

R8-21. See response to Comment R4-8.

R8-22. See response to Comment R2-12 from DWR regarding the interpretation of the SMARTS experiments presented in the 2000 REIR/EIS.

R8-23. See responses to Comments C9-12 and C9-13 regarding the use of DeltaSOQ in the impact analysis. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", for a discussion of the methods used to evaluate project effects on DBPs.

R8-24. Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", discusses the use of the Malcolm Pirnie equation in the impact analysis.

R8-25. Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", discusses project effects on bromate and use of the Ozekin equation. The commenter is correct that the equation in the text on page G-19 of Appendix G of the 2000 REIR/EIS shows an incorrect exponent for DOC; however, the results shown in Figure G-11 used the correct equation. The correct equation indicates that a 20% change in chloride (i.e., bromide) will cause a 14% change in bromate concentration.

R8-26. See Master Response 6, "Significance Criteria Used for the Water Quality Impact Analysis", regarding the significance criteria used in the analysis. See also responses to Comments R4-2, R4-3, and R4-4 regarding significance criteria, estimates of natural variability and modeling uncertainty, and operational controls adopted as part of the Delta Wetlands Project WQMP. See response to Comment R8-17 regarding CCWD's salinity goal for delivered water.

The WQMP and the protest dismissal agreement between Delta Wetlands and CCWD include the provision that a change in chloride of 10 mg/l would be used as the operational limit for Delta Wetlands operations. For more details, see response to Comment C9-17 and the protest dismissal agreement (which is included in the Appendix to the Responses to Comments).

R8-27. See response to Comment R8-17 regarding CCWD's salinity goal for delivered water. See response to Comment C9-12 regarding use of a representative export location in the impact analysis.

R8-28. The commenter questions changes made to equations taken from the antecendent outflow–salinity model (or the "G-model") used to predict EC. CCWD's G-model reports *14-day* average EC and outflow values. Therefore, this information must be modified for use in the *monthly* assessment model. The salinity–outflow equation used in the monthly assessment model assumes that end-of-month salinity will correspond to end-of-month effective outflow, which is calculated using the monthly G-model equations.

The monthly model does not ignore the possible time lag between Jersey Point EC and Rock Slough chloride, but assumes that the salinity increase will occur during the same month. If the analysis assumed that the increase occurred during the following month, the timing of project effects could be mischaracterized. See response to Comment C9-12 for a detailed discussion of the use of representative export location and the timing of project effects.

The coefficient for estimating effective outflow for Jersey Point salinity was changed for the 2000 REIR/EIS analysis to be consistent with the value used by CCWD in the G-model (i.e., 6,600 rather than 5,000), as shown in the equation on page G-9 of Appendix G. Appendix G provides comparisons of measured EC values at these locations.

R8-29. The 1995 DEIR/EIS and the 2000 REIR/EIS disclosed unavoidable significant effects of the Delta Wetlands Project as required by CEQA. As described above, the water quality impact assessment identified significant direct and cumulative effects on water quality and proposed feasible mitigation measures. No information provided in this comment letter changes the significance findings in the 2000 REIR/EIS; no new unavoidable impacts are identified.

R8-30. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

R8-31. The cumulative impact assessment presented in the 1995 DEIR/EIS and 2000 REIR/EIS meets the requirements of CEQA. See response to Comment C9-52.

R8-32. See response to Comment R8-4 regarding the mitigation measures recommended in the 2000 REIR/EIS.

R8-33. Responses to the issues listed in this comment are provided above.

R8-34. The typographical errors noted in this letter were taken into consideration when the responses to the preceding comments were prepared.

Letter R9 JES/JMC

STATE OF CALIFORNIA—THE RESOURCES AGENCY

GRAY DAVIS, *Governor*

CC: BJL

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July 31, 2000

Jim Sutton
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812-2000

Subject: Comments on the Revised Draft Environmental Impact Report/Statement (RDEIR) for the Delta Wetlands Project; SCH Number: 1995093022

Dear Mr. Sutton:

I am writing regarding the above-named environmental document dated May 31, 2000. The proposed project is located in the Primary Zone of the Delta in San Joaquin and Contra Costa Counties. Local government actions associated with approval of the proposed project would be subject to appeal to the Delta Protection Commission. State and federal actions are not subject to appeal to the Delta Protection Commission, thus comments on State and federal actions are advisory only. The Commission itself has not had the opportunity to review the RDEIR so these are staff comments only. The comments are, however, based on the Commission's law and adopted land use plan, as well as other research reviewed and accepted by the Commission. The Commission was charged with protecting and enhancing the existing land uses in the Delta, including agriculture, wildlife habitat and recreation. In addition, the stability of the levees was identified as a critical charge.

The proposed project is a water storage and habitat enhancement project on four islands in the Delta. The project includes:

- diverting and storing water on Bacon Island and Webb Tract for later discharge for export or to meet outflow or environmental requirements;
- diverting water seasonally to create and enhance wetlands and to manage wildlife habitat on Bouldin Island and most of Holland Tract; and
- building recreational facilities for boating and hunting along the perimeter levees on all four islands.

The RDEIR addresses only five key resource areas:

- Water supply and operations
- Water quality
- Fisheries
- Levee stability and seepage
- Natural gas facilities and transmission pipelines.

The Commission's enabling legislation states the Commission's land use plan should "permit water reservoir and habitat development that is compatible with other uses" (PRC Section 29760(b)(14)). The Commission's adopted land use plan includes a recommendation which states "Water reservoirs that are consistent with other uses in the Delta should be permitted"(Land Use Recommendation). Recommendations were incorporated in the Plan to address Delta actions that go beyond local government authority; the authority to allow the proposed diversions and storage are State and federal actions. The proposal to construction recreational facilities is subject to local government approvals.

The RDEIR does not address issues associated with the conversion of agricultural land to reservoir and managed habitat, the creation of several thousand acres of habitat as mitigation for the creation of the reservoirs, nor the recreation component of the project which includes construction of several facilities and up to 1,200 berths.

The issues addressed in the RDEIR of concern to the Commission include water quality, seepage, and levee stability.

The Commission's land use plan states: "Salinity levels in Delta water shall ensure full agricultural use of Delta agricultural lands, provide habitat for aquatic life, and meet requirements for drinking water and industrial use" (Water Policy P-1) and "Water agencies at local, state and federal levels shall work together to ensure that adequate Delta water quality standards are set and met and that beneficial uses of State waters are protected consistent with the CALFED agreement" (Water Policy P-3).

> The RDEIR indicates that the proposed project could result in increased salinity in the west Delta and includes mitigation measures. Those mitigation measures should be incorporated into the final approvals for the project to ensure that water in the western Delta is adequate for agriculture. **R9-1**

The Commission's land use plan states: "Water reservoirs that are consistent with other uses in the Delta should be permitted" (Land Use Recommendation R-1) and " The priority land use of areas of prime soils shall be agriculture. If commercial agriculture is no longer feasible due to subsidence or lack of adequate water supply or water quality, land uses which protect other beneficial uses of Delta resources, and which would not adversely affect agriculture on surrounding lands, or viability or cost of levee maintenance, may be permitted..."(Environmental Policy P-1).

> Seepage has been identified as a likely impact on nearby islands that are used for agriculture. The RDEIR includes a number of mitigation measures, including interceptor wells, to minimize impacts dues to seepage. Those mitigation measures should be incorporated into the final approvals for the project to ensure that seepage does not adversely impact agriculture on nearby islands. **R9-2**

The Commission's land use plan states: "...local governments shall adhere to guidelines for federal and local levee maintenance and construction...and set longer term goals of meeting PL-99 standards..." and "As much as feasible, levees should be designed and maintained to protect against damage from seismic activity..."(Levee Recommendation R-13).

> The RDEIR includes substantial additional modeling and information about levee stability associated with the reservoirs. The RDEIR states that the interiors of the reservoir levees will need to be reinforced to protect against erosion. The applicant should determine if the project must conform to levee or dam standards, and develop appropriate designs to meet the State's requirements. The project would provide levees built to the standards in Bulletin 192-82, which is more stringent than PL-99. The project should ensure that the reservoir levees are adequate to protect against slumping or erosion. **R9-3**
>
> The RDEIR does not discuss any possible impacts associated with the proposed construction of levee facilities on the stability of the levees. The Final environmental document should state whether the construction of the proposed recreational facilities will require any mitigation or design change to the levee to ensure levee stability.

Since the DEIR was released in 1995, new information about recreation needs and about hunting has been made available. The DEIR describes the proposed private fishing and hunting facilities proposed for each island. No public access or recreation is proposed as part of the project. The Delta Protection Commission and Department of Boating and Waterways retained the Department of Parks and Recreation to prepare a Delta Recreational User Survey in 1997. That report, available in hard copy from the Commission, and on the Commission's web site--www.delta.ca.gov--outlines current facilities and activities, and recreational needs in the Delta. In addition, hunting has continued to decline in California with resident hunting licenses down 61% between 1970 and 1998 and State duck stamps down 58% in the same period (Valley-Bay Care, Ducks Unlimited, Spring 2000). Fishing has remained popular with a slight decrease (8%) in the same period. This new information should be reflected in the final environmental document. **R9-4**

The DEIR identified the loss of agricultural land on the project islands as "inconsistent with Contra Costa County agricultural principles to preserve prime agricultural lands for agricultural production and promote a competitive economy and would therefore be a significant and unavoidable land use impact. Direct conversion of approximately 16,180 acres...or of 20,345 acres...including harvested cropland and pasture, short-term fallowed land, and long-term idled lands, is considered to be a significant and unavoidable agriculture impact. Implementation ...would contribute to the significant and unavoidable cumulative impact of cumulative conservation of prime agricultural land in the Delta" (page 3I-1). The final environmental document should address the cumulative impact of the loss of agricultural land in the Delta taking into account the **R9-5**

acreage proposed for conversion to habitat, conveyance and storage in the CALFED programmatic environmental document. **R9-5 cont'd**

In summary, the final environmental document should include appropriate mitigation to protect Delta water quality, to ensure stable levees within the project, and to ensure that seepage from the proposed reservoirs does not adversely impact nearby agricultural islands. In addition, the final environmental document should address issues raised in the earlier DEIR regarding recreation opportunities and loss of agriculture.

Please call if you have questions about these comments.

Sincerely,

Margit Aramburu
Executive Director

Cc: Chairman Patrick N. McCarty
Supervisor Joe Canciamilla
Supervisor Steve Gutierrez
Terri Roberts, State Clearinghouse

Delta Protection Commission

R9-1. The 2000 REIR/EIS evaluated salinity impacts for Jersey Point and Emmaton using the WQCP salinity objectives at these compliance locations, suggesting that mitigation may be required for some potential Delta Wetlands diversion periods. The SWRCB has incorporated mitigation measures as terms and conditions of Delta Wetlands' water right permit. Similarly, USACE will adopt mitigation measures in the record of decision for the Section 404 permit.

R9-2. The SWRCB has incorporated mitigation measures as terms and conditions for Delta Wetlands' water right permit. Similarly, USACE will adopt mitigation measures in the record of decision for the Section 404 permit.

R9-3. See response to comment B7-6 regarding the application of DSOD standards to the Delta Wetlands Project.

Driven pile foundations are typically used to support structures adjacent to levee embankments that are underlain by compressible materials such as peat. The stiff and dense soil beneath the peat will bear the weight of these structures. For the Delta Wetlands Project, the recreation facilities will not impose significant loads on the levees; therefore, they will not affect the design or stability of the levee. Levee inspection and maintenance at these sites must be maintained in compliance with the reclamation district's criteria for locating structures near the structural section of the levee. These criteria can vary between reclamation districts. Delta Wetlands must receive approval of the final design for the recreation facilities from the reclamation district before constructing the facilities.

It should be noted that Delta Wetlands has removed the construction of recreation facilities from its CWA permit application, and USACE will not approve construction of these facilities when it issues its record of decision. Refer to Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

R9-4. The lead agencies acknowledge the importance of public recreation in the Delta. See response to Comment B6-21.

R9-5. The cumulative impact of the Delta Wetlands Project on agricultural land in the Delta is considered significant and unavoidable (see Impact I-8, "Cumulative Conversion of Agricultural Land", in the 1995 DEIR/EIS [page 3I-25 in FEIS Volume 1). Implementation of CALFED contributes to this cumulatively significant conversion of agricultural land in the Delta.

Letter R10

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July 31, 2000

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Re: Delta Wetlands comments to the Revised Draft Environmental Impact Report/Statement for the Delta Wetlands Project

Dear Messrs. Sutton and Finan:

Delta Wetlands Properties ("Delta Wetlands") is providing the enclosed comments to the Revised Draft Environmental Impact Report/Statement ("REIR/S"). As you are aware, the Delta Wetlands project has endured extensive environmental review. Delta Wetlands believes this additional review, in certain instances, goes beyond the requirements of the California Environmental Quality Act and the National Environmental Policy Act. Delta Wetlands agreed to the additional assessment in order to provide information to the State Water Resources Control Board ("SWRCB") in response to the November 25, 1998 correspondence from the SWRCB.

Jones & Stokes has done an excellent job, once again, in assimilating the various environmental information and providing a comprehensive report. The enclosed comments consist of specific references to the REIR/S which outline our substantive concerns and an Errata which addresses typographical errors and misunderstandings regarding the Delta Wetlands project.

Sincerely,

Barbara A. Brenner

Barbara A. Brenner

BAB:rko
enc.

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DELTA WETLANDS COMMENTS TO THE REIR/S
(July 31, 2000)

General Comment

The *Revised Draft Environmental Impact Report and Environmental Impact Statement for the Delta Wetlands Project* ("REIR/S") prepared for the State Water Resources Control Board ("SWRCB") and the U.S. Army Corps of Engineers ("USACE") contains a number of very conservative assumptions and approaches to the analysis for the Delta Wetlands project. The California Environmental Quality Act ("CEQA") and the National Environmental Policy Act ("NEPA") require a reasonable assessment of a project's potential environmental impacts in order to help the lead agencies (SWRCB and USACE) evaluate the project for permitting purposes. The REIR/S has gone beyond the CEQA/NEPA requirements in numerous instances by making overly conservative assumptions in its analysis, which have led to conclusions which are unreasonably conservative. The REIR/S should clearly delineate, at a minimum, the type of analysis that is required by CEQA and NEPA, and should identify the instances in which the analysis is intentionally conservative. The document should also indicate that, as a result of conservative analyses, mitigation measures recommended on the basis of such overly conservative analyses should be carefully considered and not automatically adopted by the lead agencies.

Delta Wetlands has provided detailed comments which include examples of conservative assumptions in the REIR/S. There are additional overly conservative assumptions incorporated in the REIR/S that are not specifically mentioned below. Given the conservative assumptions explicitly recognized in the REIR/S, as well as those outlined by Delta Wetlands which are not explicitly identified, a clarifying statement in the REIR/S is justified and would result in a more fair and reasonable assessment of the project.

R10-1

Chapter 2. Project Description

Page 2-5, third paragraph. The level of demand for CVP/SWP water is assumed to remain at 1995 levels in the cumulative future analysis with no explanation or justification. Assuming the demand remains at 1995 levels is a very conservative approach. The REIR/S should clearly set forth the fact that the analysis is conservative and explain why such is the case.

Chapter 3. Water Supply

Page 3-4 , third paragraph. The REIR/S in its discussion of DWRSIM studies 409 and 771 should note the effect an increase in Trinity River flows, the recent interpretation of the CVPIA(b)(2) rules, and the need to obtain Level 4 water for refuges would have on these DWRSIM water demand assumptions. These increased water demands, along with a growing

population, nullify the DWRSIM assumption that water demand is the same today as in 1995. In addition, this further supports Delta Wetlands' contention that the REIR/S assumptions are extremely conservative. **R10-1 cont'd**

Chapter 4. Water Quality

Page 4-37, first paragraph and page 4-38, first paragraph. The salinity modeling presented in the REIR/S assumes that 100% of the volume and 100% of the mass of water quality constituents (e.g., chlorides, DOC) in Delta Wetlands discharges goes to the municipal water supply export pumps. However, because of mixing processes within the Delta, assuming that 100% of the mass of water quality constituents in Delta Wetlands discharges will reach the municipal water supply export pumps is a very conservative approach. Discharges from the Delta will mix with water in the channels, effectively distributing its DOC and TDS content to water that reaches the export pumps and water that does not (e.g., outflow and irrigation water). In addition, the mixing equation relied upon in the REIR/S is based on monthly monitoring averages and does not account for the time lag between the discharge from the Delta Wetlands reservoirs and the arrival at the export pumps. This time lag serves to further dilute the impact of Delta Wetlands waters at the export pumps. This analysis should clearly indicate it is a conservative approach to the analysis or more accurately account for the percentage of the mass of water quality constituents that will reach the municipal water supply export pumps. **R10-2**

Page 4-29, third paragraph; page 4-41, first paragraph; and page G-14, fourth paragraph. It is unclear why the 1g/m^2/mo DOC loading estimated for the islands under agricultural use is assumed to continue from the four project islands even after agricultural activities are discontinued. It is mentioned in the REIR/S that this is based on comments received on the 1995 DEIR/S, but no rationale is provided. The REIR/S states that, *"Although Delta Wetlands would cease farming operations on the islands under project conditions, the contribution of Delta Wetlands islands to agricultural drainage DOC is simulated as a constant under no-project and with-project conditions in response to comments on the 1995 DEIR/EIS."* (REIR/S, p. 4-29, ¶ 4.) The 1g/m^2/mo agricultural DOC load is added to the estimated project DOC loads, effectively double counting the islands' potential effect on long-term DOC impacts. This assumption is much more conservative than the DOC assessment set forth in the 1995 DEIR/S. The REIR/S should indicate this is a very conservative assumption and is based solely on comments to the 1995 DEIR/S. The REIR/S should also set forth the probability of this event occurring. **R10-3**

Figures 4-20 through 4-22; pages G-14 through G-15; page 4-22, fifth paragraph. The graphical representations of the three Delta Wetlands operation simulations for the three assumed DOC loading rates (1, 4, and 9 g/m^2/mo) appear to represent constant loading at these rates from the island soils to the stored water during all time periods examined. This approach may be appropriate for the 1 g/m^2/mo scenario, which was intended to represent the long-term loading from project discharges. However, as the text of the REIR/S indicates, the 4 g/m^2/mo and 9 g/m^2/mo were selected to represent initial filling conditions, not long-term loading conditions. **R10-4**

Figures 4-21 and 4-22 result in significant overestimation of total DOC contribution, the frequency, and duration of high DOC discharges from the islands. It appears that start-up conditions were modeled every month for the 73 years of projected operation. This presentation of the model results is misleading and inconsistent with the model assumptions. **R10-4 cont'd**

Pages 4-17 to 4-22. We concur with the REIR/S statement, *"It should be noted that the SMARTS experiments do not represent the proposed conditions on the Delta Wetlands islands, and the experimental design and sampling methods may not be applicable to in-situ conditions."* (REIR/S, p. 4-22, ¶ 3.) We therefore do not agree with the extensive reliance on the SMARTS data as the primary basis for the initial loading estimates used in the REIR/S (4 and 9 $g/m^2/mo$). Significant reliance on the SMARTS results for quantitative assessments is not appropriate, given the serious limitations of the data as acknowledged by the REIR/S.

The SMARTS data should not be used to develop quantitative estimates of potential DOC impacts from the Delta Wetlands project. As noted in the REIR/S, the SMARTS experiments are not reliable because of soil source variations, depth of peat soils used, and uncertain volume and concentration measurements. There are additional reasons for not relying on the SMARTS results which should also be noted, including temperature concerns, and the lack of photodegradation and biodegradation availability. The soil porosity, percent compaction, or any other physical soil parameter of the material was not recorded. The submersible pumps almost certainly provided more mixing and soil/water interface disturbance than would occur under actual reservoir conditions,[1] and there are numerous inconsistencies in the data that render the data unreliable. **R10-5**

On page 4-21, the REIR/S authors state that *"These values [mass loading estimates] suggest that submerged peat soil with a previous history of agricultural use may produce a DOC load of 2 to 5 times the measured agricultural drainage DOC loads (of about 12 g/m^2)."* This statement is problematic because: (1) It depends on the SMARTS work accurately reflecting full-scale flooded island conditions, (2) it incorporates the unclear calculation discussed above, and (3) it does not address the difference between short-term and long-term DOC loading from the soils. The REIR/S DOC analysis should not rely on the SMARTS results to quantify the potential impacts of the Delta Wetlands project. Again, at a minimum, the REIR/S should clearly set forth the probability of the project experiencing initial DOC loading of 4 or 9 $g/m^2/mo$.

Page 4-30, first paragraph. The REIR/S states, *"Reservoir operations might cause more DOC to be mixed from the pore water into the water column than when the peat soils are drained*

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[1]On page 4-21, paragraph 2, the REIR/S states that, *"The submersible pumps may mimic wave-induced mixing that would occur on the Delta Wetlands islands."* This statement does not appear to be based on a scaled engineering analysis. Marvin Jung, the director of the SMARTS experiments, stated that these pumps were included to provide thorough mixing of the water column during the experiments and were not necessarily designed to replicate wave action on Delta Wetlands islands (pers. comm., 7/7/00).

under agricultural practices." This is contrary to the 1995 DEIR/S in which the two scenarios were assumed to introduce equal concentrations of DOC into the water column. The REIR/S acknowledges a lack of evidence on the subject, yet suggests a completely unsupported scenario. This seems to contradict the 1995 DEIR/S where it was thought that less DOC might leach out but assumed the same as a conservative estimate. In this instance the REIR/S compounds the overly conservative assessment of the previous document; it should at least make this clear. **R10-6**

Page 4-39, third paragraph, and page 6-1, first paragraph. Many of the potential salinity impacts identified in the REIR/S (e.g., Emmaton) appear to be the result of filling the reservoirs with high salinity water. The DeltaSOQ model predicts salinity levels in the Delta at the end of each month and uses this salinity level to simulate the reservoir quality for diversions during the following month. A more accurate simulation would be to average the monthly salinity during the month of filling. This "prior month" approach elevates salinity levels on the reservoir and is unreasonably conservative since it assumes the water stays at the highest salinity level (e.g., end of previous month) for the entire month of diversions. The REIR/S should assess the effects on salinity using average monthly salinity levels. The project is likely to have a salinity benefit if analyzed using the monthly average salinity level. **R10-7**

Page 4-42, second and third paragraphs. The project effects on export DOC for the initial-filling and high initial-filling assumptions are characterized as occurring in more than half of the years of operation (e.g., 37 out of 73, 48 out of 73). Initial filling will only occur the first year of operation. The project's initial DOC loading estimates are very different from the long-term DOC loading estimates. The REIR/S should clearly state the limits of the initial DOC loading estimates as to probable time and duration. **R10-8**

Page G-12, fourth bullet. The REIR/S adds residence time as a factor which affects DOC loading. The 1995 DEIR/S, however, established that most of the DOC is released in the initial months after the reservoir island first stores water and then there is little or no continued increase. Adding residence time as a factor in DOC loading estimates is not supported by the scientific evidence and is an unreasonably conservative approach. The REIR/S should at least clearly state this is another very conservative assumption. **R10-9**

Page G-18, eighth paragraph; Figure G-10a; page 4-14, third paragraph, page G-16, first paragraph; page G-19, seventh paragraph. Delta Wetlands agrees with the REIR/S assertion that source water DOC measurements do not always correlate well with treated water THM concentrations. This conclusion is supported, for example, by data on the influent DOC and treated water THM presented in the REIR/S for the Penitencia Water Treatment Plant. **R10-10**

However, it is suggested that discharges from the project islands be regulated based on their effect on treated drinking water THM concentrations by using raw water DOC as the predictor of THM concentrations in treated drinking water (Mitigation Measure C-6). Mitigation Measure C-6 does not appear to consider Delta Wetlands' potential effect on treated water THM concentrations which should be determined considering the role of water treatment processes in reduction of the amount of DOC that can potentially be converted to THMs. The processes of

coagulation, flocculation, sedimentation, and filtration within a typical water treatment plant can remove DOC to varying degrees depending on many parameters such as points of chlorine addition, coagulant dose, chlorine dose, temperature, and others. These treatment steps are not accounted for in THM formation potential tests. Not accounting for treatment plant-specific processes, their sequence and operational parameters, and their effect on DOC concentrations through the plant, will result in overestimating the project's potential effects on THMs. **R10-10 cont'd**

This difficulty is recognized to some degree in Appendix G of the REIR/S: *"Because DBP concentrations are determined by both the raw water quality parameters (DOC and Br^-) and the treatment process parameters (chlorination dose* [note: coagulant dose and DOC removal before chlorination is another significant consideration], *pH, temperature, holding time), only representative estimates of the incremental effects of increased DOC and Br^- concentrations on these DBP concentrations can be calculated."* This limitation is, however, overlooked in the main REIR/S text (Chapter 4): *"...frequent DOC measurements may be used to monitor project effects on THM concentration..."*.

Chapter 5. Fisheries

Page 5-9, Impact Assessment Methodology. The REIR/S should emphasize that the modeling methodology employed, particularly the USFWS salmon survival model and the entrainment index for salmon, produce results that are "worst case", high-end estimates of potential impact. The models' parameters do not account for the fact that the Delta Wetlands project will eliminate 92 unscreened agricultural diversions and the remaining diversions on Delta Wetlands reservoir islands will be consolidated and have the most protective fish screen criteria ever implemented in California (e.g., 0.2 fps max. approach velocities). Entrainment potential at the Delta Wetlands diversions is eliminated for salmonids and is extremely low for all other fish species under the final operations criteria ("FOC"). Adding a statement describing the conservative bias of the analysis will improve understanding of the bases for the "less-than-significant" findings. **R10-11**

Page 5-15, second paragraph. The REIR/S should add that the FOC also indirectly protects Mokelumne River chinook salmon through biological monitoring during Delta Wetlands project operations. Biological monitoring will be conducted from December through August when Delta Wetlands is diverting to storage or discharging. Operations will be adjusted to accommodate presence of delta smelt during these times, and since juvenile Mokelumne River salmon migrate through the Delta channels during these same periods, they would potentially benefit from the real-time operation's adjustments for Delta smelt. **R10-12**

Chapter 6. Levee Stability and Seepage

Page 6-7, first full paragraph. Relief wells on adjacent islands were not eliminated from consideration. Delta Wetlands' proposal is to use interceptor wells on Delta Wetlands reservoir islands because installing such a system does not require permission from adjacent reclamation **R10-13**

districts and private property owners. However, if permission is attainable, Delta Wetlands may elect to install wells on adjacent islands. Likewise, a cutoff wall is not the preferred choice due to economics, but a cutoff wall may be considered if necessary. These measures have been shown to be technically feasible (e.g., page App. H, ES-7) and it should be noted that there are various alternatives for the final levee design. Delta Wetlands will have a monitoring program in place to evaluate effectiveness of seepage control systems including relief wells or pumped wells or other systems. **R10-13 cont'd**

Page 6-10, fourth paragraph; page 6-20, first bullet; and App. H, page ES-5, fourth bullet. Delta Wetlands does not believe that background monitoring wells should be limited to one mile or less from the reservoir because the background monitoring wells are intended to describe Delta-wide variations and need to monitor a larger geographic area. Delta Wetlands intends to install over 25 monitoring wells at locations more than one mile (and commonly two to three miles) from Delta Wetlands reservoir islands. These background wells will be spread over approximately 15 islands in the Central Delta. Data from these numerous wells would be used as a group to form the basis of assessing truly regional conditions. They are intended to provide a measure of groundwater response to a flood condition, periods of prolonged rainfall, and major changes in evapotranspiration. The text also stated that URSGWC has recommended this requirement. However, Delta Wetlands could find no such recommendation in Appendix H. **R10-14**

Page 6-10, fifth paragraph. Delta Wetlands agrees that more than one background monitoring well should be used for each row of seepage monitoring wells. All of the background monitoring wells should be used together to describe the Delta-wide variations that would be used in establishing background conditions. Delta Wetlands believes that attempting to rigorously monitor the local background conditions opposite each seepage monitoring well would be a complex and infeasible proposition. See comments for page 6-10, paragraph 10. **R10-15**

Page 6-10, sixth paragraph. Delta Wetlands does not believe three years of groundwater data are required. Delta Wetlands' assessment, based on the existing eight years of groundwater monitoring data collected for the Delta Wetlands project, is that a one-year initial period covers the statistically significant issues. The variables are predominately driven by daily, monthly, or yearly cycles. When the Delta Wetlands project is operating, the background wells will be collecting data far from the influence of the Delta Wetlands project. These wells would be used to assess the longer term trends and make appropriate adjustments in the data interpretation. Set forth below are the various factors that are expected to have any significant influence on groundwater data: **R10-16**

(1) tidal within 12-1/2 and 25 hour periods, a 28 day period and a one year period;
(2) rainfall within a one year period;
(3) normal runoff events within a one year period;
(4) evapotranspiration within a one year period;
(5) irrigation and other agricultural practices within a one year period.

Delta Wetlands compared the one year versus the three year baselines and their effect on the significance criteria using the existing eight years of groundwater monitoring data and determined that the correlation between the two is 0.999. Due to this correlation, Delta Wetlands urges that this recommended change to the background groundwater monitoring not be required. **R10-16 cont'd**

Page 6-10, seventh paragraph. URS recommends a straight-line mean be used in the seepage performance standards. Delta Wetlands assumes that this approach is intended to be used initially, but that seepage performance standards will be reassessed once operation commences to allow for future improvements in the performance standard criteria. **R10-17**

Page 6-10, eighth paragraph; Table 6-4, impact D-2; App. H, page 2-20, fourth paragraph; App. H, page 2-21, first paragraph (first bullet). The REIR/S suggests that the single well action limits for seepage be changed from one foot over 2 standard deviations to one-half foot over 2 standard deviations. Delta Wetlands believes that there are sufficient natural variations to require a higher tolerance for single wells. The seepage performance standards are intended to establish the limit for which Delta Wetlands must take action to ensure there is no net seepage caused by the project to the neighboring islands. This is contrary to the REIR/S assumption that the seepage performance standards are intended to provide evidence of the Delta Wetlands project causing seepage onto a neighboring island.

Using a seven point running average of the weekly data collected over an eight year period at 30 monitoring well locations, the annual mean and standard deviation for each well was computed for the first full year of data. These data were subject to the same factors expected to have a significant influence on groundwater data addressed in comments to page 6-10, sixth paragraph. From these statistical measures of actual field conditions, the two criteria were analyzed. The first was the criterion recommended by Delta Wetlands and reviewed by the Seepage Committee (annual mean + 2 standard deviations + 1.0 foot). The second criterion was that contained in the REIR/S (annual mean + 2 standard deviations + 0.5 foot). **R10-18**

For each of these, the frequency of false positives was analyzed for all of the available data (approximately eight years). For this group of data, no false positives occur using the Delta Wetlands recommended criteria. However, using the REIR/S proposed criteria, 72 false positives occur.

For the REIR/S proposed criteria, the 72 false positives occur during 38 different weeks. Where more than one well indicated a false positive during a week, only one of the false positives is counted for that week. The average monitoring well was read 332 times during the eight-year sampling period. The false positives occur during 38 of the 332 times monitored, approximately one week out of every nine.

The available data show that the single well trigger criterion recommended in the REIR/S is too strict to allow reasonable operation of the project. Delta Wetlands' original criterion that had been previously reviewed by the Seepage Committee protects neighboring islands from potential

seepage impacts and is a more practical criterion. The recommendation to lower the criterion by 0.5 foot is unreasonable and should not be adopted. **R10-18 cont'd**

Page 6-10, tenth paragraph; App. H, page ES-5, second bullet (second paragraph); App. H, page 2-19, fifth and sixth paragraphs; App. H, page 2-20, fifth paragraph (second and third bullets). The geotechnical analysis attempted to correlate individual wells within an island. Their apparent premise was that Delta Wetlands intended to use one or two background wells on an island as the basis for establishing groundwater conditions unaffected by the Delta Wetlands project. This is not the Delta Wetlands plan. Delta Wetlands intends to install over 25 monitoring wells at locations more than one mile (and commonly two to three miles) from Delta Wetlands reservoir islands. These background wells will be spread over approximately 15 islands in the Central Delta. Data from these numerous wells would be used as a group to form the basis of assessing truly regional conditions. They are intended to provide a measure of groundwater response to a flood condition, periods of prolonged rainfall, and major changes in evapotranspiration.

Delta Wetlands has not proposed a quantitative measure of locally induced variations, such as land use and irrigation practices. Seasonal variations within each island that are primarily induced by agricultural practices have always been recognized as an issue requiring special consideration. Delta Wetlands views these issues to be between individual fields and not between adjacent islands. Groundwater levels can be affected locally by individual field's crops, planting dates, and irrigation patterns. While the REIR/S proposal to add more monitoring wells deserves consideration, to be reliable it would almost require a background monitoring well opposite each seepage monitoring well. Delta Wetlands believes it would be difficult to achieve farmer authorization to place monitoring wells in or immediately adjacent to the fields for the following reasons: (a) the monitoring wells will likely get in the way of farming activities, (b) farmers may wish to reconfigure their fields without having to consider monitoring well locations, (c) many farmers may not be receptive to having outsiders go into the farmed fields when monitoring well servicing or data downloading is needed, and (d) some landowners may simply not want Delta Wetlands monitoring wells on their private property. The only reasonably accessible locations for wells within the island interiors would be along existing roads. Most of these roads are parallel to drainage ditches, many of which penetrate to the underlying sand aquifer. Wells placed near these ditches would be strongly impacted by water levels in the ditches and would not provide reliable background data. **R10-19**

Local farming practices will receive a qualitative assessment. For example, if a single well was showing increased head and an adjacent field was recently flooded, a conclusion that Delta Wetlands reservoir storage was causing the increased head in that one well would be pre-mature. If the head remained high after the local effects of field flooding were over, than a conclusion regarding Delta Wetlands reservoir causation might be made.

Delta Wetlands believes that the REIR/S approach attempts to give a precision to the "background" condition that may be impractical to achieve in a rigorous form for use in

computing the Delta Wetlands operations limits. Delta Wetlands believes this is unreasonable and urges that this recommended change to the Seepage Performance Standard not be required. R10-19 cont'd

Page 6-13, first paragraph, fourth bullet; App. H, page ES-6, third bullet; App. H, page 3-9, fourth paragraph; App. H, page 3-10, ninth paragraph; App. H, page 4-2, eighth paragraph. This is a conservative assumption since sudden drawdown does not apply to this project. Under no condition is the water level lowered faster than the maximum pumping capacity of the reservoir pumps, which is approximately 3000 cfs (or 13 inches per day). In its analysis, URS also assumed no drainage during this sudden drawdown. This is a very conservative assumption since the drawdown of only 13 inches per day will allow some drainage of the soils during the drawdown period and thus result in greater soil strengths and a higher factor of safety. R10-20

Page 6-14, fifth paragraph; App. H, page ES-6, first bullet; App. H, page 3-15, last paragraph; App. H, page 4-2, fifth paragraph. The REIR/S states that URS estimates that the levees could take four to six years to construct depending on final design. Delta Wetlands has prepared a preliminary levee design that can be accomplished in approximately one year. The alternatives considered by URS did not include the early construction of wide toe berms to buttress the levees and to increase the factor of safety. The REIR/S should explicitly state that time for construction clearly depends on final design. R10-21

Page 6-20, first paragraph. Delta Wetlands believes that "adequate warning" will be provided. The reservoir will be initially filled in stages, allowing careful review of seepage monitoring data. Under operating conditions, the reservoir will fill at between one-half and one foot per day. This slow loading will ensure adequate warning of any potential problem. R10-22

Page 6-21, first paragraph. For purposes of the traffic analysis in the 1995 DEIR/S, Delta Wetlands projected a 1.5 year project construction period. Delta Wetlands is not aware of any other estimate it has provided. At this time, Delta Wetlands believes it can safely build the levees in stages, with limited time between the lifts. Project construction continues to be estimated at approximately 1.5 years. R10-23

Page 6-21, third paragraph. Our analysis indicates that modifications to the levee crest can increase the factor of safety to offset the decrease in safety factor from constructing the Delta Wetlands levees and filling the reservoir. Design options which will be considered include removing some of the material on the slough side of the levee crest to reduce the mass and driving forces toward the water. Reshaping the levee crest can be used to achieve a factor of safety of 1.3 or other criteria established during the hearings. R10-24

Page 6-21, fourth paragraph; App. H, page ES-6, second bullet. The crest modification noted above is a better alternative where a wide crest is required. By reducing the weight near the slope, Delta Wetlands can achieve an adequate factor of safety (1.3).

App. H, page 1-1, fifth paragraph. Line 13: "emergency response" overstates the immediate response. No emergency necessarily exists but, rather, Delta Wetlands would be outside the agreed tolerance of seepage and must correct the seepage to continue water storage. **R10-25**

App. H, page 2-4, fifth paragraph. This paragraph does not distinguish between the historical characterization (1989-1997), and the "baseline readings" to be taken for all piezometers before the project becomes operational. The historical (1989-1997) groundwater data were collected to identify general trends and variations in the groundwater regime beneath levees on islands adjacent to or part of the Delta Wetlands project. These historical data are not used in the final seepage monitoring program.

The "baseline" or "pre-filling" data will be collected from all of the seepage monitoring wells and background monitoring wells for a period of one year prior to the first stage filling of the reservoirs. These are the baseline data that will be used to create standards by which seepage will be assessed. **R10-26**

The monitoring which commenced in 1989 and 1990 was stopped in 1997 and is not continuing. Groundwater monitoring will be re-initialized at least one year prior to commencement of reservoir filling. To the extent practical, the earlier monitoring wells will be included in the seepage monitoring and background monitoring systems.

App. H, page 2-8, fifth paragraph. "The water table level at the far toe was considered to be an important indicator of impacts ..." URS seems to be suggesting that measuring the water level at a neighboring island's toe will provide a better measure of potential Delta Wetlands reservoir impacts. This is not the case, however, since the potential changes in water level will be more pronounced the closer the monitoring station is to a reservoir island. **R10-27**

App. H, page 2-17, fifth paragraph; App. H, page 2-10, first paragraph. Seepage control measures will already be occurring. Adjustments to seepage control may be needed. Exceedence will trigger a cessation in reservoir filling and is indicative of being outside allowable operating limits. **R10-28**

App. H, page 3-6, third paragraph. The 35 foot width proposed by Delta Wetlands includes the width of the riprap and, by default, the mass and width is included in the analysis. The mass of the riprap should be included in the analyses and will affect the factor of safety. **R10-29**

App. H, page 3-9, first paragraph. Toe berms will increase the factor of safety to acceptable levels. They will also speed up the time required to construct the levees. **R10-30**

App. H, page 3-15, third paragraph; page 4-2, sixth paragraph. A build-out of 4 to 6 years is not reasonable. If the project was committed to only building a 5:1 slope it may be reasonable, but it could be readily accomplished by buttressing the 5:1 slope with large toe berms. The project will place whatever fill is needed at the toe to safely construct the levee to achieve a one-year levee construction schedule. For example, our analysis indicates that a 12:1 buttress starting **R10-31**

at elevation 0 feet will provide a safe buttress of the 5:1 slopes and assumes the material would be placed in 4 lifts with a 3-month wait between lifts. The first lift is 3 feet, the second lift is 4 feet, the third lift is 4 feet and the fourth lift is the remaining fill needed to complete the levee slope and crest. This takes into account the strength gain in the peat at the end of each stage prior to placing the next lift. **R10-31 cont'd**

App. H, page 3-18, first paragraph; Figures 3.7.2 and 3.7.3. There is no need to continue to raise grade to accommodate settlement. This is not necessary for the project nor is it planned. The only place that it will be done would be the levee crest, which is the purpose of making the levee wider at the start of levee improvement. The project does not intend to continually fill to achieve a 5:1 slope. The project will fill to create a crest wide enough to accommodate about 2 feet of future levee raising and to achieve a safe levee. The levee crest and slopes will then be allowed to settle after initial construction. The final slope inclination will depend on the shape that occurs after consolidation. **R10-32**

Chapter 7. Natural Gas Facilities

Page 7-6, first full paragraph. In the Delta region of California, there is also a risk of third party damage from agricultural operations in addition to subsidence, flooding, etc. **R10-33**

Page 7-7, third paragraph. The flooding for reservoir operation will only change the manner in which PG&E monitors and repairs leaks to its pipelines under Bacon Island. PG&E is familiar with these procedures since the adjacent island, Mildred Island, has been continuously flooded for seventeen years. **R10-34**

Figures 7-8 and 7-9. If PG&E requests, a specially designed erosion protection system could be done in this area to limit any filling to that which occurs under existing operating conditions. Therefore, there will be no impacts to their facilities at the levees. **R10-35**

Page 7-8, last paragraph. The levee improvements proposed by Delta Wetlands are no greater than those conducted during ongoing levee maintenance activities and are what CALFED is planning for all Delta islands. Reclamation District No. 2028, which includes Bacon Island, has previously sent a letter informing PG&E that DWR Bulletin 192-82 has been adopted as the reclamation district standard and that all levees would be improved to this standard. **R10-36**

ERRATA

Table 2-1, first page. The comparison of the 1995 DEIR/S and the 2000 REIR/S project descriptions does not mention the relocation of the Bacon Island discharge pump station from Old River to Middle River. The map of Bacon Island (Figure 1-3) has the discharge properly relocated. **R10-37**

Page 4-43, fourth paragraph. A mass balance equation for DOC is developed in the REIR/S to determine an allowable Delta Wetlands discharge rate, given the DOC concentration on the project islands, the existing export DOC concentration, an assumed allowable export DOC concentration increase due to project discharge, and the existing export flow rate. The first mathematical expression at the end of the third paragraph on page 4-43 appears reasonable. However, the rearranged version of that DOC mass balance equation shown just thereafter has a missing term in the parenthetical term in the denominator. The corrected version of this simplified equation (using the nomenclature of the REIR/S) is as follows:

Corrected Equation:

$$\text{Delta Wetlands Discharge} = \frac{DOC_{increment} \times \text{Export w/o DW}}{(\text{Delta Wetlands DOC} - DOC_{export} - DOC_{increment})}$$ **R10-38**

Page 4-46, third paragraph. It appears the assumption in the example regarding Delta Wetlands DOC concentration should be 8 mg/l greater than export DOC levels.

Page 5-3, sixth bullet. The term "smolt" is specific to juvenile anadromous salmonids and by convention is not applied to non-salmonid species of anadromous fishes.

Page 5-7, third paragraph. The NMFS conference opinion on steelhead was adopted on May 19, 2000, as part of the NMFS' biological opinion for the Delta Wetlands project.

Page 5-12, seventh paragraph. The generalized treatment of Delta Wetlands project water temperature management criteria in this paragraph may be construed by some readers to mean that a potential, mitigated, temperature impact on outmigrating spring run salmon exists. This is highly unlikely given the timing of their outmigration during the later fall, winter, and early spring months. A clearer statement should be added that the Delta Wetlands project will not have any thermal impacts during the months of spring run outmigration. This statement could be followed by the description of the FOC temperature management criteria, although active temperature management will not be necessary during the periods of spring run outmigration. **R10-39**

Page 5-13, third paragraph. This paragraph is discussing the percentage of returning juvenile salmon in the Mokelumne. The 90% reference is confusing. Does this mean among the adults that return, 90% are released as juveniles in the Mokelumne?

Page 5-14, third paragraph. The discussion of FOC terms should include that fish screening measures highly protective of even fry-sized salmonids will be in place during Delta Wetlands project operations. This is an important FOC element specifically applicable to Mokelumne River fishery concerns. **R10-39 cont'd**

Page 6-2, second paragraph. Relief wells and other alternates may be used for seepage control

Page 6-4, Factor of Safety. "Factor of Safety" is not correctly defined.

[A] The factor of safety for slope stability is most commonly defined as the ratio of (1) the ultimate shear soil strength along a assumed sliding surface to the (2) portion of the shear strength needed to keep the calculated forces in balance (in equilibrium).

[B] The stipulated design values for factors of safety are not "minimum values to be stable" but rather provide generally acceptable margins for unknowns and importance.

R10-40

Page 6-7, fourth paragraph. Harding Lawson Associates used a 2D finite element model (SEEP) in its initial assessment of seepage conditions. This same model will be used in final design (HLA 1989 pp. 32-33). The "plane-view" modeling was used to assess the impacts of borrow area proximities and, recognizing the validity of superposition, was an appropriate screening tool for assessing pumping rate attributable to borrow areas.

Page 6-10, tenth paragraph. The term "shallow" background wells (10 to 20 feet deep) is misleading. All monitoring wells will penetrate the peat soils (where present) and will be screened in the top several feet of the underlying sand aquifer (where present). These "shallow" background wells will extend to the same approximate elevations as all other monitoring wells.

Figure 6-3. All landside slopes are incorrectly labeled landslide slopes.

App. H, page 2-4, first paragraph. Wells were located on the far side of the seep ditch.

App. H, page 2-4, first paragraph. The REIR/S states, "Water elevation in the sand aquifer became flat ..." However, the hydraulic grade line was reversed by the pumping. This means that, in addition to completely cutting off seepage from slough and flooded Mildred Island, water was also flowing toward the pumped wells from the interior of McDonald Island.

R10-41

App. H, page 2-4, second paragraph. The conclusion is misrepresented. For the passive flow relief system the hydraulic grade line was flat, indicating that all seepage was being intercepted.

App. H, page 2-4, third paragraph. The report should explain that the "no settlement" conclusion applies to a neighbor's island.

App. H, page 2-5, fifth paragraph. The statement, "The groundwater level beneath the levees is generally near sea level" is not true. URS shows groundwater heads at Elevation -15 feet in

their seepage model. The average groundwater level in the three reliable original monitoring wells on Bacon Island and Webb Tract is about Elevation -15 feet.

App. H, page 2-6, first paragraph. [5th bullet in list]: Monitoring stopped in December 1997.

App. H, page 2-12, fifth paragraph. This paragraph infers a description of actual conditions rather than modeled conditions. The head beneath the levee and at the toe are created by the assumed boundary conditions and permeabilities. The tone is misleading.

App. H, page 3-2, fourth paragraph. The peat is not 10 to 20 feet thick below levees. It is typically 25 to 30 feet thick. This statement conflicts with the statement on page 3-4, paragraph 2.

App. H, page 3-2, seventh paragraph. The table is on page 3-5, not page 3-3.

App. H, page 3-17, third paragraph. The borrow pits will not be dewatered. Probably the material will be removed hydraulically but in any case dewatering is not planned.

R10-41 cont'd

Page 7-1, first paragraph. Please change the last sentence to read "The PG&E testimony...."

Page 7-7, fourth paragraph. Risks to the pipeline may temporarily increase during Delta Wetlands' construction of the levees.

Page 7-8, second paragraph. PG&E uses concrete saddle weights, drilled chance anchors and concrete pipe coating to anchor line 57A (See Clapp testimony at 2).

Page 7-8, last paragraph. To monitor the effect of levee settlement, PG&E has installed and maintains "tiltmeters" on line 57B at both the east and west levee crossings of Bacon Island.

Page 7-9, third paragraph. Due to the nature of leaks, a walking inspection would typically not be useful for a minor or small leak but a leak inspection for a small or minor leak could be useful if performed by boat when the island is flooded.

Page 7-10, second bullet. This bullet should be modified to read: "Annual inspections to detect leaks, monitor corrosion protection, identify potential levee...."

R10-42

Page G-8, first paragraph. The use of 400,000 acres for lowlands contribution appears to be a mistake in calculation. Approximately 100,000 acres are actually peat soil and from earlier studies it has been determined that the mineral soil islands actually do not exhibit any increase in DOC loading. There are approximately 100,000 acres of peat soil remaining in the Delta. If the estimate is corrected, the actual increases at the point of export would agree with what is assumed as aerial loading on peat soil islands.

R10-43

Delta Wetlands Properties (Ellison & Schneider)

R10-1. CEQA and NEPA do not preclude the use of conservative analysis of impacts. Substantial controversy has surrounded some elements of the proposed project, and there has continued to be substantial disagreement among experts on some key issues (e.g., effects of the project on DOC). The lead agencies directed that a conservative approach to the analyses of such issues be used in the 2000 REIR/EIS to ensure that the concerns of commenters on the 1995 DEIR/EIS and water right protestants would be addressed adequately. See also Master Response 8, "Levee Stability Analysis and Worst-Case Conditions".

As described in Chapter 3, "Water Supply and Operations", of the 2000 REIR/EIS (see Chapter 3A of Volume 1 of this FEIS), the results of DWRSIM study 771 were used as the basis of simulations of Delta Wetlands Project operations performed using DeltaSOS. DWRSIM study 771, which uses 1995 hydrology and demands, is the currently accepted standard used by CALFED and other state water planners to represent baseline conditions. Using the 1995 level of development for SWP/CVP project demands and deliveries allows the evaluation of the greatest level of Delta Wetlands operations likely to occur. Results for Delta Wetlands operations would differ slightly if demands and deliveries under a 2020 level of development were assumed with existing facilities.

Several factors that influence SWP and CVP operations changed during 2000. However, the simulations of potential Delta Wetlands operations based on DWRSIM 771 results remain adequate for assessment purposes. The possible changes in future Delta operations and the corresponding changes in Delta Wetlands operations are discussed in Chapter 3A of FEIS Volume 1.

R10-2. The DeltaSOQ model does assume that all Delta Wetlands discharges move to the exports. The purpose of the environmental impact analysis is to identify significant environmental impacts associated with implementing the proposed project. Therefore, the modeling of Delta Wetlands Project operations used a "worst-case" scenario in which all water discharged by the project was simulated as being exported through the SWP and CVP pumps. This assumption was used to allow for simulation of the greatest detrimental effects on water supply, water quality, and fishery resources.

R10-3. The commenter is correct in stating that the 2000 REIR/EIS did not credit the Delta Wetlands reservoir islands with a reduction in DOC loading from cessation of agricultural activities. This was a conservative analysis. However, until measurements from flooded reservoir islands are available, this conservative estimate is appropriate for purposes of water quality impact assessment.

R10-4. Figures 4-20, 4-21, and 4-22 in the 2000 REIR/EIS (Figures 3C-45, 3C-46, and 3C-47, respectively, in Chapter 3C of Volume 1 of this FEIS) show the potential DOC concentration in water stored by Delta Wetlands assuming DOC loading rates of 2, 5, and 10 g/m^2/month, respectively, and using the monthly water operations simulated for the proposed project by DeltaSOS. Periods when Delta Wetlands' DOC concentration is

shown in the figures as 0 mg/l represent those periods when the reservoirs are empty. The commenter is correct in noting that these figures show the same assumed DOC loading throughout a 24-year period (1972–1995). The purpose of these figures is to show the potential DOC concentrations during the first filling, which would not be repeated year after year. The specific project operations during the year of the first filling are unknown; therefore, the figures show the initial-fill loading for each year to provide examples of the potential range of DOC concentrations under different annual project diversion, storage, and discharge scenarios.

R10-5. As described in Chapter 4 of the 2000 REIR/EIS (see Chapter 3C of Volume 1 of this FEIS), the SMARTS experiments have somewhat limited applicability to the Delta Wetlands Project. The results of the SMARTS experiments were considered in conjunction with estimates from other studies and expert testimony to develop assumptions about Delta Wetlands reservoir islands under initial-fill operations. The lead agencies directed that the analysis in the 2000 REIR/EIS explore a range of potential DOC loading rates during water storage on the reservoir islands so that a range of potential project effects on DOC concentrations in exported water could be estimated. However, it is not possible to determine the probability that DOC loading would occur at the higher or lower rate under reservoir operations. There remains a great deal of uncertainty regarding the amount of DOC loading that may occur on the reservoir islands. Therefore, the recommended mitigation measures include a requirement that DOC on the reservoir islands be monitored and project operations be adjusted when project discharges are predicted to have a significant adverse effect on export DOC. The Delta Wetlands Project WQMP includes measures to address DOC levels; the full text of the WQMP is included in the Delta Wetlands–CUWA agreement in the Appendix to the Responses to Comments.

R10-6. The 1995 DEIR/EIS analysis did assume that the DOC load from the project reservoir islands would probably be about the same as under agricultural land use practices. Although this may still be true, the 2000 REIR/EIS included a range of possible DOC loads, from 2 times to 10 times the estimated agricultural DOC load. This range of higher assumed DOC loadings was simulated to fully evaluate potential DOC concentrations in the reservoir island water. Measurements from the actual reservoir islands would be needed to identify the appropriate range of assumed DOC loading conditions. See also response to Comment R10-5.

R10-7. The commenter is correct in noting that the impact analysis assumed that the salinity of water diverted onto the Delta Wetlands islands was equal to the previous month's export salinity. This is a conservative assumption. The purpose of the environmental impact analysis is to identify significant environmental impacts associated with implementing the proposed project. Therefore, the modeling of Delta Wetlands Project operations used a conservative approach in evaluating salinity impacts of the project. No change to the analysis is needed.

Additionally, the FOC, Delta Wetlands Project WQMP, and CCWD protest dismissal agreement each have operational controls that would limit the salinity impacts of the

project. The WQMP includes modeling and monitoring provisions to track and report the salinity effects from Delta Wetlands diversions and discharges. See response to Comment C9-1 for more information about the WQMP.

R10-8. The frequency of simulated high DOC effects during periods of Delta Wetlands discharges for export is reported to indicate that the higher DOC loadings would be more likely to cause elevated DOC concentrations in exported water. Under this assumption, mitigation would be required more often. See response to Comment R10-4 above.

R10-9. The period of inundation does have some effect on the slow release of DOC from peat soil. Most of the loading may occur during the initial filling, but longer residence times could affect DOC concentrations in water released from the reservoir islands even under long-term conditions.

R10-10. The 2000 REIR/EIS acknowledged that the THM concentrations estimated using the Malcolm Pirnie equation are much more sensitive to the operational parameters of treatment plants than to the expected changes in DOC or bromide caused by Delta Wetlands operations. The changes caused by Delta Wetlands Project operations will be smaller than identified in the 2000 REIR/EIS under the limitations on project operations described in the CCWD and EBMUD protest dismissal agreements and the Delta Wetlands Project WQMP. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts".

Mitigation Measure C-6 would use the measured concentrations of DOC and bromide in project discharges along with the measured DOC and bromide levels at the export locations to evaluate the effects that the change in DOC and bromide caused by Delta Wetlands would have on the THM concentration in a typical treatment plant. For the mitigation measure to be effective, this determination must employ the most accurate equation or other method available for determining effects of DOC and bromide on THM.

Additionally, the Delta Wetlands Project WQMP includes more specific procedures for estimating the effects of Delta Wetlands operations on changes in concentrations of DOC and bromide in raw water, and the subsequent effects on DBPs (THM and bromate). The data collection at the treatment plants discussed in the WQMP would presumably increase confidence in the ability of the equations to follow the variations in THM and bromate caused by changes in the raw water quality.

R10-11. In the USFWS model used for the impact assessment for spring-run chinook salmon, survival has a linear relationship with water temperature and exports; therefore, exports are assumed to have the same effect on survival regardless of the location of the diversion, the efficiency of the fish screens, the source of water exported, the discontinuation of unscreened agricultural diversions, and the conditions of flows in Delta channels. For the 2000 REIR/EIS analysis of project impacts on spring-run chinook salmon (see Chapter 3F of FEIS Volume 1), Delta Wetlands diversions and export of Delta Wetlands discharge were both treated as "exports" in the USFWS model. This is a conservative, worst-case

approach to assessing conditions under project operations because it does not consider the following:

Delta Wetlands diversions would be made through fish screens that would be substantially more efficient than the fish facilities for SWP and CVP exports. The screens would have an approach velocity of 0.2 foot per second and, given the location of Delta Wetlands diversions on Delta channels, substantial bypass flows. With implementation of the screen design criteria specified in the biological opinions, juvenile chinook salmon would not be entrained and impinged.

Most of the water currently exported from the Delta by the CVP and SWP pumps originates from the Sacramento River. Delta Wetlands water would be discharged for export in the channels of the central and south Delta; it would affect channel flows in a more restricted area than would water originating from the Sacramento River that is exported by the CVP and SWP pumps.

The FOC restrict Delta Wetlands diversions to periods of relatively high outflow and channel flow, so the effects of project diversions are expected to be minimized.

Delta Wetlands would forgo making agricultural diversions onto the project islands, thus eliminating entrainment that may be associated with the currently unscreened diversions.

Because the USFWS model used to assess effects does not incorporate these factors, the analysis presented in the 2000 REIR/EIS is conservative and presents a worst-case scenario for project operations.

R10-12. The commenter is correct in stating that, in addition to the elements of the FOC listed on page 5-15 of the 2000 REIR/EIS (page 3F-57 of Chapter 3F of FEIS Volume 1), FOC terms related to the delta smelt FMWT index and to monitoring would further minimize adverse effects on juvenile chinook salmon that originate from the Mokelumne River. The presence in Delta channels of juvenile chinook salmon from the Mokelumne River during February and March would coincide with the potential presence of delta smelt. According to the FOC, if the delta smelt FMWT index is less than 239, Delta Wetlands would not divert from February 15 through June. This restriction covers most of the period when juvenile salmon from the Mokelumne River could be present in the Delta.

In addition, Delta Wetlands would reduce diversions at a diversion station to 50% of the previous day's diversion rate when monitoring shows that delta smelt are present. Such reductions would also minimize effects on juvenile chinook salmon from the Mokelumne River.

R10-13. The commenter is correct. Relief wells and cutoff walls remain feasible options for Delta Wetlands' seepage control system. See also response to Comment C15-7.

R10-14. The bullet statement referenced by the commenter, which appeared on page 6-10 of the 2000 REIR/EIS, has been removed; it is not consistent with recommendations made in Appendix H. The seepage modeling determined that a background well should be at least 1,000 feet from the nearest monitoring well. This is the distance beyond which the reservoir is estimated to have no impact on the natural groundwater level.

R10-15. See response to Comment R10-19 below.

R10-16. The geotechnical experts who prepared Appendix H reviewed the data referenced by the commenter. The data show a strong autocorrelation between the 1-year and 3-year running averages during the 8-year period of record. This result suggests that there would be very little difference between the results of the 1-year and 3-year monitoring and that using 1 year of data should be sufficient. Therefore, Chapter 6 of the 2000 REIR/EIS has been revised to reflect this change. The third bullet on page 6-10 has been changed as follows (see page 3D-30 of Volume 1 of this FEIS):

> # At least ~~3~~ 1 year~~s~~ of data should be used to establish reference water levels in the background monitoring wells and in at least half of the seepage monitoring wells before reservoir operations begin.

The third bullet under "Mitigation Measure RD-2: Modify Seepage Monitoring Program and Seepage Performance Standards" on page 6-20 (FEIS Volume 1, page 3D-39) has been revised as follows:

> # Use at least ~~3~~ 1 year~~s~~ of data to establish reference water levels in all the background monitoring wells and in at least half of the seepage monitoring wells.

R10-17. As stated in Chapter 6 of the 2000 REIR/EIS (Chapter 3D of FEIS Volume 1), the seepage performance standards should be reevaluated periodically after reservoir operations begin.

Additionally, the protest dismissal agreement submitted by Delta Wetlands and EBMUD during the water right hearing proposes a technical review committee, identified in the agreement as the "Reservoir Island Monitoring and Action Board (MAB)". Under the terms of the protest dismissal agreement, the MAB could review and approve changes to the seepage performance standards.

R10-18. Appendix H of the 2000 REIR/EIS recommends that the "leeway" for a single monitoring well be reduced to 0.5 foot and notes that the proposed 0.25-foot leeway for the average of three wells is acceptable. ("Leeway" is the additional range above the mean plus two standard deviations that accommodates the high variability of Delta conditions.) The recommendation of 0.5 foot of leeway may be adjusted as supported by existing data and findings from periodic evaluations after startup. Additionally, other data (e.g., undesirable seepage effects such as reported impacts on agriculture in adjacent islands, or results of well-effectiveness tests) may be used in conjunction with the seepage

performance standards to assess the need for changes to the proposed standards. As discussed above, the performance standards should be supported by the results of carefully implemented monitoring, reviewed periodically after reservoir operations start to validate their utility, and updated as needed. The 1-foot leeway performance standard proposed by Delta Wetlands may be acceptable if it is shown to be practical when performance standards are reevaluated. However, for purposes of initial start-up, the 0.5-foot leeway is recommended.

R10-19. It is understood that data from the background wells would be used as a group to determine regional conditions. The shallow or in-field background wells described in the 2000 REIR/EIS are recommended as a potential method for considering the local variation of groundwater levels that is attributable to local pumping for farming operations. These wells could measure when changes in groundwater levels in monitoring wells may be caused by local farming practices versus when they may be caused by reservoir operations.

The complicating factors associated with installing such a system of wells on neighboring properties are also recognized. Therefore, although there may be merits to using these wells to differentiate between the effects of local farming practices and those of reservoir operations, these wells are not required to offset seepage impacts of the proposed project. They are not included in the recommended mitigation measure, "Modify Seepage Monitoring Program and Seepage Performance Standards", described in Chapter 6 of the 2000 REIR/EIS (Chapter 3D of FEIS Volume 1).

R10-20. The commenter is correct in stating that emptying the reservoir islands under a maximum-pumping scenario would allow the soils to drain somewhat and would result in greater soil strengths and a higher FS than the results of the sudden drawdown condition presented in the 2000 REIR/EIS. Assuming instantaneous drawdown was clearly a conservative modeling choice.

R10-21. The 2000 REIR/EIS recognizes that the amount of time needed for construction would depend on the final design. As discussed in response to Comment R6-18, construction monitoring would be required to determine the rate of fill placement. Additionally, there are techniques that could be used to increase stability during construction, such as the following, which are illustrated in Figure R10-1:

Place the new fill in stages (see Figure R10-1[a]). Each construction stage would need to achieve required consolidation settlement and strength gain before the next stage could be constructed.

Place the fill at such a gentle slope that the shear strength of the underlying weak soils is not exceeded (see Figure R10-1[b]). Because this method may require very gentle slopes, large columns of fill may be necessary. Depending on the cost of fill, this could become prohibitively expensive.

Install sand drains and wick drains through the weak foundation soil to greatly speed up the drainage process and hasten consolidation and strength gain (see Figure R10-1[c]). Delays between stages would be much shorter under this method; therefore, construction would proceed more quickly.

As stated in the 2000 REIR/EIS, the rate of construction would depend on the final design.

R10-22. The fourth full paragraph on page 2-20 of Appendix H discusses the expected lag time between reservoir pumping and changes in the water table at the toe of the adjacent island's levee.

R10-23. The commenter is referring to the following statement on page 6-21 of the 2000 REIR/EIS: "As described in the 1995 DEIR/EIS, levee improvements would be completed in layers or lifts less than 5 feet thick and allowed to settle to ensure that an appropriate FS would be maintained. Delta Wetlands estimated that it would take several years to complete levee improvements". This statement is based on information that Delta Wetlands provided to the lead agencies for the 1995 DEIR/EIS analysis. Page 3D-12 of the 1995 DEIR/EIS (page 3D-14 of FEIS Volume 1) states, "As proposed, levee reconstruction on the Delta Wetlands Project islands would be staged over several years to allow time for consolidation of foundation materials". The traffic analysis assumed a 1.5-year construction period to estimate worst-case traffic impacts from construction activity. See also response to Comment R10-21 above.

R10-24. See response to Comment R6-12.

R10-25. The word "emergency" was used broadly to indicate that a timely response would be required.

R10-26. The information in Appendix H regarding the groundwater data collection is incorrect and should read as follows:

> Data collection began in February 1989, and ~~continues today~~ was discontinued in 1997.

Information in the text of Chapter 3D has also been revised. See response to Comment E14-7.

See response to Comment R10-16 above for information about the collection of baseline data.

R10-27. The commenter is incorrect. The referenced text in Appendix H does not suggest that monitoring would be more effective at a neighboring island's levee toe than on the neighboring levee. Rather, changes in groundwater levels at the levee toe may be more indicative of changes that could adversely affect farmed fields on adjacent islands.

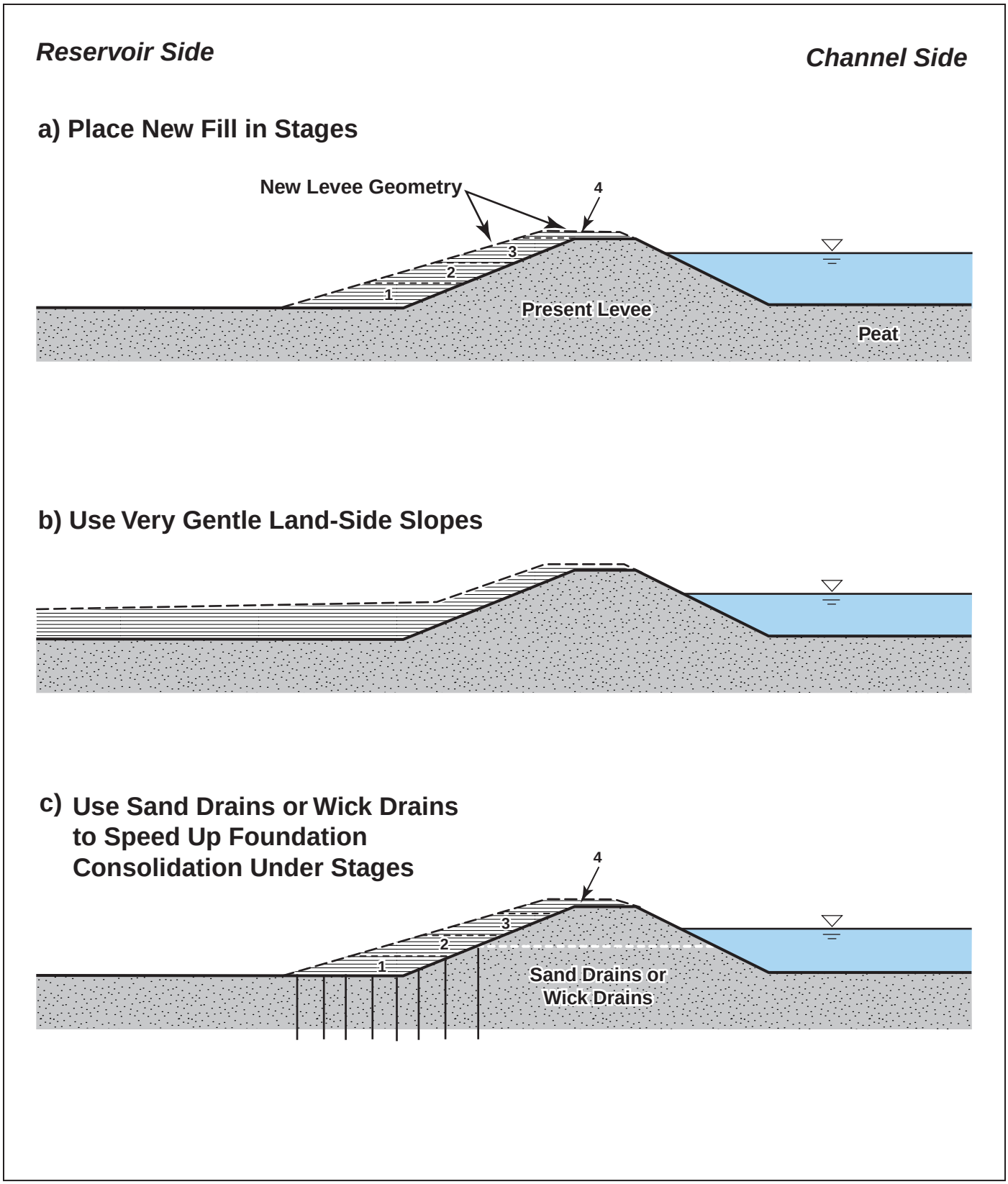

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Figure R10-1
Methods to Improve End-of-Construction Stability

R10-28. The phrase "trigger seepage control measures" is used to indicate that Delta Wetlands would need to alter the existing control measures (i.e., increase pumping rates) or stop reservoir filling activities. The analysis acknowledges that use of the interceptor wells to control seepage would already be occurring.

R10-29. As stated in the referenced text, using the mass of the riprap in the analysis could increase the FS, but the effect on the results of the analysis would be minor. No change to the analysis is needed.

R10-30. See responses to Comments R6-12 and R10-21 above.

R10-31. See responses to Comments R6-12 and R10-21 above.

R10-32. The comment refers to text on page 3-16, not page 3-18, of Appendix H of the 2000 REIR/EIS. The levee stability analyses presented in Appendix H and Chapter 6 of the 2000 REIR/EIS are based on the proposed levee improvements described in Chapters 2 and 3D of the 1995 DEIR/EIS. As stated in Chapter 3D under "Flood Control Features" (see page 3D-8 of FEIS Volume 1):

> The initial levee crest would be constructed approximately 8 feet wider than the long-term planned width (22 feet) to accommodate settlement and to allow for future levee raising. (Harding Lawson Associates 1993.) The new slopes would meet or exceed criteria for Delta levees outlined in DWR Bulletin 192-82.

See also Figure 3D-5 in FEIS Volume 1.

R10-33. The discussion in question on page 7-6 of the 2000 REIR/EIS (page 3E-27 of Chapter 3E of FEIS Volume 1) refers to natural causes of pipeline failure, not third-party causes. Third-party incidents are noted under the second bullet item on page 7-5 (FEIS Volume 1, page 3E-27).

R10-34. The comment appears to restate the discussion in question. No response is required.

R10-35. Currently, the project description does not include special treatments or levee designs on Bacon Island to limit stresses on the PG&E facilities. Because detailed levee designs that consider local subsurface conditions have not yet been completed, it is premature to conclude that the project would have no effect on the PG&E facilities. Delta Wetlands could propose an alternate levee design to minimize potential effects on the gas pipelines, but the proposed designs would also need to meet the levee stability criteria described in Chapter 6 of the 2000 REIR/EIS.

R10-36. The levee improvements proposed by Delta Wetlands are greater than those completed over the last 15–20 years as part of ongoing levee maintenance. The environmental baseline for impact analysis is the existing condition in 1987 or 1994 (see Chapter 3,

"Overview of Impact Analysis Approach", in Volume 1 of this FEIS). The reclamation district may upgrade its levees to meet the DWR Bulletin 192-82 standard in the future; however, the levees do not currently meet that standard, and the reclamation district adopted the standard after the baseline was established for impact analysis. If the Bacon Island levees are improved under agricultural use and the Delta Wetlands Project is later permitted and implemented, the incremental increases in settlement or subsidence and the resulting effect on the pipelines caused by the Delta Wetlands Project would be smaller than anticipated in the 2000 REIR/EIS impact analysis.

R10-37. The following information has been revised in Table 2-1:

Project Feature	Proposed Project, as Evaluated in the 1995 DEIR/EIS	Proposed Project, as Evaluated in the 2000 REIR/EIS
Pump Station Design	One discharge pump on each reservoir island, with 40 new pumps (on Bacon Island) or 32 new pumps (on Webb Tract) with 36-inch-diameter pipes discharging to adjacent Delta channels. Typical spacing would be 25 feet on center. An assortment of axial flow and mixed-flow pumps would be used.	Same as in 1995 DEIR/EIS~~.~~, but the discharge station on Bacon Island has been relocated from Old River to Middle River.

R10-38. The equation at the bottom of page 4-43 in the 2000 REIR/EIS has been revised as follows (see page 3C-79 of Chapter 3C of FEIS Volume 1).

$$\text{Delta Wetlands discharge} = \frac{DOC_{increment} \bullet Export_{without\ Delta\ Wetlands}}{(\text{Delta Wetlands DOC} - DOC_{export} - DOC_{increment})}$$

The example given on page 4-46 in the 2000 REIR/EIS (FEIS Volume 1, pages 3C-81 and 3C-82) has been revised as follows:

> For example, if the monthly maximum increase in DOC concentration were established as 0.8 mg/l (corresponding to 20% of the average export DOC value, which was used as the significance criterion) and if the measured Delta Wetlands DOC concentration were 8 mg/l greater than the export DOC concentration, then the Delta Wetlands Project discharge would be limited to 10% of the export pumping (including Delta Wetlands discharge).

R10-39. On page 5-3 of the 2000 REIR/EIS, the fourth bullet has been revised as follows (see page 3F-46 in Chapter 3F of FEIS Volume 1).

> # *Smolt:* A juvenile ~~fish~~ chinook salmon or steelhead that has undergone physiological change enabling it to survive in saltwater.

At the top of page 5-8 (FEIS Volume 1, page 3F-50), the sentence has been revised as follows:

> ~~USACE has requested that~~ NMFS formally adopted the conference opinion as its biological opinion on steelhead for the Delta Wetlands Project on May 19, 2000.

Water temperature was not simulated for Delta Wetlands discharge; however, there is the potential for temperature-related effects on spring-run chinook salmon. The potential temperature-related effects of project operations on winter-run chinook salmon are addressed by the FOC, which have been incorporated into the proposed project. See "Increase in Temperature-Related Mortality of Juvenile Chinook Salmon" in Master Response 4, "Impacts on Fisheries Identified in the 1995 Draft EIR/EIS and Adoption of Biological Opinions". Additionally, the NMFS biological opinion for project effects on Central Valley spring-run chinook salmon (see the appendix to this volume) includes the requirement that Delta Wetlands monitor and report on daily receiving water temperature and DO conditions and changes to those conditions that result from Delta Wetlands discharges. NMFS will use the information to determine whether the project is affecting spring-run chinook salmon to an extent not considered previously.

On page 5-13 of the 2000 REIR/EIS (FEIS Volume 1, page 3F-55), the information in the third full paragraph has been revised as follows:

> ~~However, the coded wire tag data provided by EBMUD showed that regardless of their origin (i.e., Nimbus Fish Hatchery), more than 90% of juvenile chinook salmon released in the Mokelumne River returned as adults to the Mokelumne River. The data also indicated that 60% to 100% of the juvenile chinook salmon produced in the Mokelumne River or at the Mokelumne River fish hatchery returned to the Mokelumne River as adults regardless of release location.~~ However, EBMUD's coded wire tag data showed that, of the juvenile chinook salmon released in the Mokelumne River that returned as adults, more than 90% returned to the Mokelumne River and only 10% strayed to other river systems. The data also indicate that, of the adult chinook salmon that originated as juveniles in the Mokelumne River or were produced at the Mokelumne River fish hatchery, 60% to 100% returned to the Mokelumne River regardless of where they were released as juveniles.

Based on these data, the amount of straying appears to depend on the river of origin and the location where juveniles were released; the available information does not indicate that

the concentration of Mokelumne River water in the central Delta affects the rates at which adults stray.

The third paragraph on page 5-14 (FEIS Volume 1, page 3F-56), which is referenced by the commenter, directs readers to details about the applicable FOC measures on the following page. The later discussion includes mention of the fish screens, which will protect juvenile chinook salmon from entrainment.

R10-40. The following changes to text in Chapter 6 of the 2000 REIR/EIS (chapter 3D of FEIS Volume 1) have been made in response to this comment.

On page 6-2 (FEIS Volume 1, page 3D-23), the following sentence has been added to the end of the second paragraph:

> Relief wells and other alternative methods of seepage control may be substituted for or used to augment the interceptor well system during final design.

On page 6-4 (FEIS Volume 1, page 3D-25), the last sentence in the definition of "Factor of Safety for Slope Stability" has been revised as follows:

> These FSs are typically above 1 and ~~are minimum values to be achieved for the slope to be considered stable.~~ are recommended or required for various conditions, including consideration of uncertainties in design and risks to life and property.

On page 6-7 (FEIS Volume 1, page 3D-28), the fourth paragraph has been revised as follows:

> Previous analyses prepared by Delta Wetlands' consultants (Hultgren and Tillis, Harding Lawson Associates, and Moffat & Nichols) used a two-dimensional finite element model (SEEP) to evaluate seepage conditions and used plan-view modeling techniques to ~~estimate seepage conditions~~ assess the impacts of borrow pits on seepage and on pumping rates. Plan-view modeling considered only horizontal seepage within the sand aquifer, where most seepage would occur. This approach does not include seepage through other elements of the subsurface strata or the effects of vertical infiltration from the storage reservoirs or adjacent channels. Consequently, the plan-view modeling approach does not adequately simulate the localized seepage conditions near the proposed interceptor-well system. Delta Wetlands plans to use the SEEP model in its final design for the seepage control system.

On page 6-11 (FEIS Volume 1, page 3D-31), the term "shallow background wells" has been replaced with "in-field monitoring wells". The following changes have been made to the text.

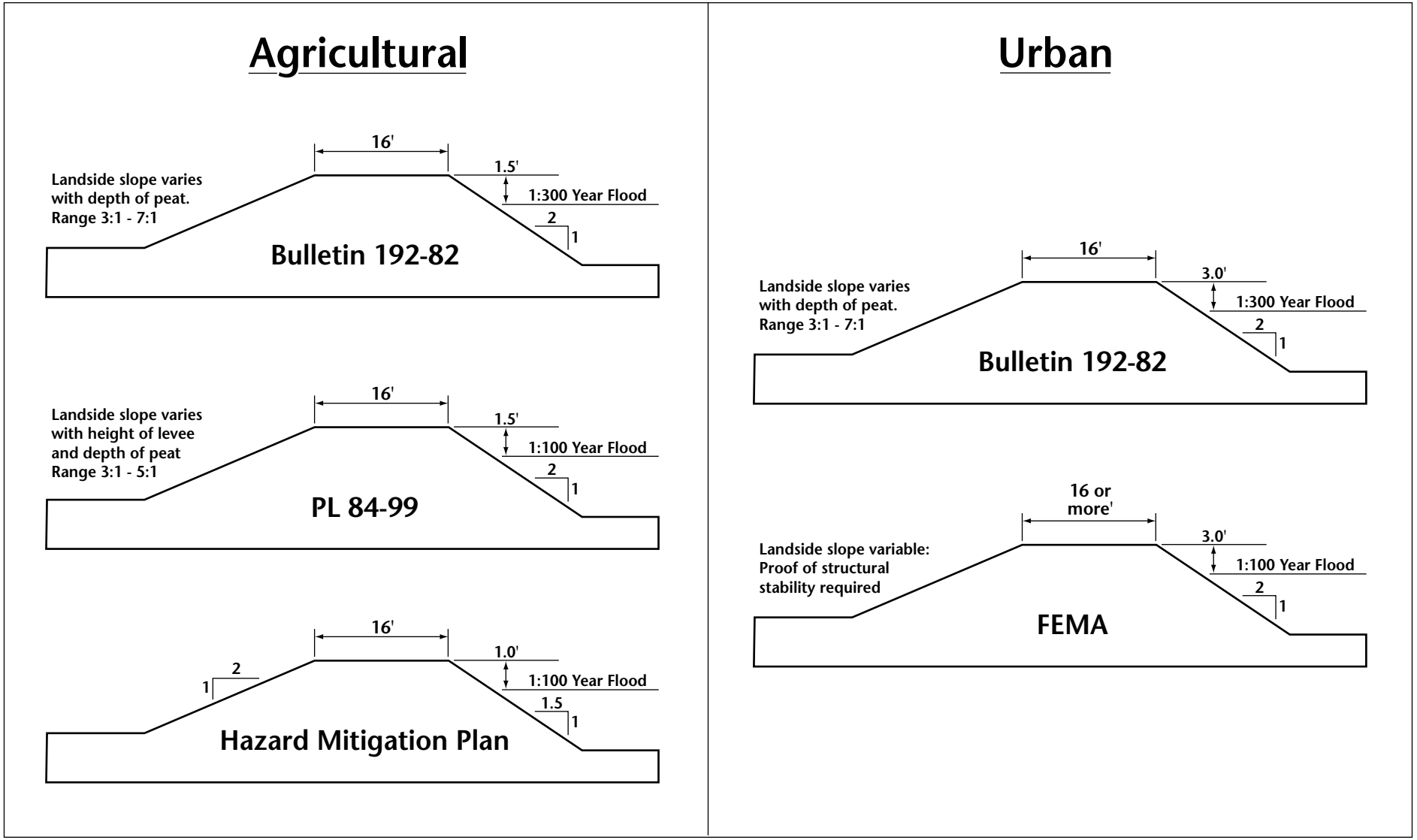

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Figure 6-3
Levee Geometric Standards

> To monitor trends in groundwater management on the neighboring islands, URSGWC recommends that Delta Wetlands supplement the proposed background well system with ~~shallow background wells (10 to 20 feet deep)~~ in-field monitoring wells installed across each neighboring island. These additional ~~background~~ wells would be placed one-half mile to 1 mile apart, beginning near the levee adjacent to the reservoir island and continuing across the adjacent island, so that groundwater levels at increasing distance from the reservoir island can be compared.

Figure 6-3 of the 2000 REIR/EIS has been corrected. See the corrected version that follows these responses. This figure is included as Figure 3D-7 in Volume 1 of the FEIS.

R10-41. Appendix H of the 2000 REIR/EIS is a final technical report prepared to provide the basis for the CEQA/NEPA impact assessment described in Chapter 6 of the 2000 REIR/EIS. The commenter's recommended changes to Appendix H have been noted; however, no changes to the text of Appendix H will be made. These changes do not affect the conclusions of the environmental analysis presented in Chapter 6 of the 2000 REIR/EIS (see FEIS Volume 1, Chapter 3D).

R10-42. Some of the commenter's recommended changes to text in Chapter 7 of the 2000 REIR/EIS (Chapter 3E of Volume 1 of this FEIS) are not substantive or are unnecessary and therefore have not been made. Where the recommended change is substantive, the text in Chapter 7 of the 2000 REIR/EIS has been revised. Those changes are listed here.

On page 7-8, of the 2000 REIR/EIS (page 3E-30 of Chapter 3E of FEIS Volume 1) the first full paragraph has been revised to include additional information as follows:

> The currently unused pipeline (Line 57-A) on Bacon Island may need additional weighting before the island is flooded to prevent the line from floating (Grimm pers. comm.). As mentioned previously, Line 57-A has concrete weights or other weighting material, except for approximately 900 feet on the west side of the island where the pipe is concrete coated. PG&E uses concrete saddle weights, drilled chance anchors, and concrete pipe coating to anchor Line 57-A. Under inundated conditions. . .

On page 7-8 (FEIS Volume 1, page 3E-29) the last full paragraph has been revised to include the following sentence:

> To monitor the effects of levee settlement on their pipeline, PG&E has installed and maintains tiltmeters on Line 57-B at both the east and west levee crossings of Bacon Island.

On page 7-10 (FEIS Volume 1, page 3E-31), the second bullet has been revised as follows:

Annual inspections to detect small leaks, ~~identify internal or external pipeline corrosion~~ monitor corrosion protection, identify potential levee subsidence or settlement problems, and prevent future pipeline ruptures or substantial pipeline leaks in those areas by prescribing immediate repair work will still be conducted in accordance with federal and state regulations.

R10-43. DWR estimates that the Delta lowlands, defined as land with an elevation of less than 5 feet above mean sea level (msl), consist of approximately 400,000 acres. The commenter suggests that perhaps only 100,000 acres of this total have peat soil that contributes to the high agricultural load of DOC. This calculation is an example of the mass-balance approach; it suggests that all of the Delta lowlands cannot be contributing the estimated DOC load of 1 g/m^2/month because this would increase the export DOC concentrations to levels that are higher than the observed values.

The DeltaSOQ model assumes that only 40% of the Delta agricultural area drainage will mix with the exports (see the bottom of page G-8 in Appendix G of the 2000 REIR/EIS); the remainder is mixed with Delta outflow. Figure G-9 shows the calculated export DOC using the mass-balance approach. The DOC load of 1 g/m^2/month from the 40% of the Delta assumed in the central Delta is still often higher than the measured DOC concentrations. Reducing the peat soil area in the central Delta would reduce the estimated export DOC concentration proportionately.

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AUG 01 2000

July 31, 2000

VIA MESSENGER

State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000
Attention: Jim Sutton

U.S. Army Corps of Engineers, Sacramento District
Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922
Attention: Mike Finan

Re: EBMUD Comments on Revised DEIR/EIS for the Delta Wetlands Project

Dear Messrs. Sutton and Finan:

The East Bay Municipal Utility District (EBMUD or District) appreciates the opportunity to review and comment on the Revised Draft EIR/EIS (RDEIR) for the Delta Wetlands Project (Project). The District and Delta Wetlands have been meeting to resolve the issues raised by the District's protest. If, however, those efforts are ultimately not successful, the Project's potential impacts upon the substantial interests of the District would remain. Consequently, this letter contains the District's comments on the RDEIR, including Attachment A (EBMUD's specific comments on Fishery Related Issues), and Attachment B (EBMUD's specific comments on Aqueduct Security Related issues).

Mokelumne Fisheries Mitigation

The RDEIR does not adequately address the potential impacts of the proposed Project operations on Mokelumne origin salmon and steelhead. Most of the potential impacts in the RDEIR are stated in terms of impacts on San Joaquin or Sacramento fisheries resources, not Mokelumne River fishery resources. A separate assessment, including identification, monitoring and mitigation of Project impacts, needs to be made for the Mokelumne River and other Eastside tributaries. This is especially true given the proximity of Webb Tract, a proposed Project reservoir island, to the North and South forks of the Mokelumne River. This assessment must be undertaken to assure that Project impacts are not simply redirected. R11-1

Detailed comments on fishery issues follow in Attachment A.

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BOARD OF DIRECTORS JOHN A. COLEMAN . KATY FOULKES . LESA R. McINTOSH
FRANK MELLON . WILLIAM B. PATTERSON . DAVID RICHARDSON . DANNY W. WAN

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Mokelumne Aqueducts Security

The Delta Wetlands RDEIR needs to include more specificity on the proposed monitoring plans and mitigation measure to minimize risk of levee failures and seepage impacts on EBMUD's Mokelumne Aqueducts. EBMUD's Mokelumne Aqueducts cross the Delta, adjacent to the Project's proposed Bacon Island Reservoir, to deliver high quality Sierra water to our 1.2 million customers in Alameda and Contra Costa counties. Essentially, the Mokelumne Aqueducts are the "lifeline" of the East Bay, as they deliver approximately 95% of the water used by EBMUD's customers. Delta Wetlands must ensure that any Project operations will not have any adverse unmitigated impacts on the Mokelumne Aqueducts or the levees that protect them. Detailed comments on Delta levees and Mokelumne Aqueduct security follow in Attachment B. **R11-2**

EBMUD appreciates the opportunity to participate and provide input on the proposed Delta Wetlands Project, and we look forward to seeing EBMUD's concerns adequately addressed.

Sincerely,

Fred S. Etheridge

JBL:SDW:tjb
Attachments
cc: Service List

ATTACHMENT A – Fishery Related Issues

Review Comments on the Delta Wetland Revised Draft EIS/EIR: Fishery Related Issues

EIR Citation	EBMUD Comment	
Page ES-4 The RDEIR states that during the 1997 water rights hearing, EBMUD raised issues about project effects on "listed" species.	EBMUD's concerns were, and are, not limited solely to listed species. For example, the Project would have potentially significant adverse impacts on the Mokelumne River fall-run chinook salmon, an important, but not listed, fish species.	**R11-3**
Page ES-6 The RDEIR fisheries assessment (Chapter 5) discusses changes in 1995 DEIR/EIS impact conclusions that have resulted from incorporation of the FOC and RPMs into the proposed project. It also discusses new listings of fish species and evaluates new information on spring-run chinook salmon occurrence provided by DFG, data on Mokelumne River **spring- chinook** salmon provided EBMUD, and new information regarding potential increases in predation with the construction of Delta Wetlands boat docks and other facilities.	"Spring–chinook salmon" should be "fall-run chinook salmon". Throughout the RDEIR, when salmon fisheries on the Mokelumne River are discussed, the analysis should focus on *"fall-run"*, as there is no spring run of chinook salmon on the Mokelumne River. While the Final Operations Criteria and Reasonable and Prudent Measures in the DFG, USFWS, and NMFS biological opinions provide protection for listed threatened or endangered delta smelt and winter-run chinook, the life history of these species is significantly different than fall-run chinook salmon. Because of these life history differences, it cannot be assumed that measures to protect winter-run chinook salmon and delta smelt will protect fall-run chinook salmon.	**R11-4**
Page 3-14 Between November and January, the diversion rate is limited to 3,000 cfs (rather than 4,000 cfs) if the DCC is closed for fish protection and Delta inflow is less than 30,000 cfs. This limitation was simulated based on monthly average inflow.	The DCC is closed to keep Sacramento River salmon from entering the Central Delta in order to reduce their exposure to export effects. Because of the location where the Mokelumne River enters the Delta, Mokelumne origin salmon would not only face exposure to the CVP and SWP export pumps, but additional exposure from the Delta Wetlands diversions. To protect the juvenile Mokelumne salmon, EBMUD suggests monitoring for the presence of salmon and practicing adaptive management techniques, such as managing location and timing of diversions so as to avoid harm to the salmon. Specific adaptive management techniques have been developed and are available for use or review as necessary.	**R11-5**

[Continued next page]

Page 5-4 Conserve in perpetuity 200 acres of shallow-water rearing and spawning habitat.	For the benefit of Mokelumne salmon, some of the 200 acres of shallow water rearing habitat should be constructed along the migratory pathway for juvenile salmon from the lower Mokelumne River and close to the Delta Wetlands Webb Tract project island. Desirable characteristics of this type of habitat include: • Shallow water (generally < 6 feet deep) • Structural diversity (includes large woody debris, diverse substrate, varying water velocities, vegetation cover) • Floodplain inundation (typically January through April, with water inundation in pulses so levels rise and fall gradually and maintain flow) • Suitable water temperatures (generally < 20 C) • Connection to river (for fish ingress and egress) (Source: Peter Moyle and Steve Cramer, personal communication)	**R11-6**
Page 5-5 Delta Wetlands will establish an environmental water fund to be controlled by DFG; the amount deposited into the fund will be based on the amount of project diversions from October through March and the amount of project discharge.	The use of the funds for the environmental water account should be reviewed by and subject to approval of the Delta Wetlands Project Technical Advisory Committee (TAC). EBMUD should have a place on that TAC	**R11-7**
Page 5-6 Delta Wetlands will establish an aquatic habitat restoration fund.	The use of the fund should be reviewed by and subject to approval of the Delta Wetlands Project Technical Advisory Committee (TAC). EBMUD should have a place on that TAC.	**R11-8**
Page 5-10 Potential effects of the Delta Wetlands Project on spring-run chinook salmon are assessed using the new data provided by DFG on spring-run occurrence and using USFWS's recently modified salmon smolt survival model	What is the reference citation for the recently modified salmon smolt survival model?	**R11-9**
Page 5-12 For Sacramento River fish, the USFWS model assumes that increased mortality attributable to export occurs in the central Delta. Closure of the DCC gates reduces exposure of Sacramento River fish to export effects. The Delta Wetlands Project does not affect operations of the DCC or the proportion of flow drawn through the DCC and Georgiana Slough. Additionally, the FOC terms require reductions in Delta Wetlands diversions if the DCC gates are closed for fishery protection (from November through January).	Mortality in the Central Delta attributable to the Delta Wetlands project should be similar to the mortality to that attributable to other exports. As DW exports increase, it is expected that central delta mortality, primarily due to export related losses, will also increase To minimize additional losses of juvenile salmon due to exports, screen opening sizes should be limited to 3/32", in accordance with NMFS Southwest Region Fish Screening Criteria for Anadromous Salmonids, dated 1997.	**R11-10**

Page 5-12 FOC terms require that project operations not cause a change in receiving water temperature greater than 7^0 C; they also prohibit channel temperature increases greater than 1^0C where channel temperatures are 13^0 to 25^0C, and increases greater than 0.5^0C where channel temperatures are more than 25^0C (see Appendix B).	Increases in temperatures from the project operations may delay the upstream migration of adult chinook salmon into the lower Mokelumne River. A delay in the upstream migration could translate into a later out migration the following year, where conditions later in the season may not be as favorable for salmon smolt survival. EBMUD suggests a two step approach to temperature increases: When channel temperatures are between 13 and 21 degrees C, temperature increases up to 1 degree C would be acceptable. When temperature in channel is over 21 degrees C, increase in temperature should be limited to .5 degrees.	**R11-11**
Page 5-13 EBMUD did not identify, and analysis of the data provided did not show, a relationship between net Delta channel flow (QWEST) and adult migration to the Mokelumne River. Although Delta channel flows varied substantially, the new information indicated minimal variability in the 50% and 90% completion dates for adult chinook salmon migration into the Mokelumne River from 1993 through 1998.	The date of ten- percent completion of adult migration past Woodbridge dam should be reviewed annually to see if project operations are delaying the upstream migration. If the data show there is a delay in upstream migration, DW should modify project operations to avoid impacts on Mokelumne origin salmon. Data on the 10% completion date has been provided to the RDEIR environmental consultant.	**R11-12**
Page 5-13 A negative QWEST indicates that very little Mokelumne River water will exit the Delta as outflow and that most of the Mokelumne River water will be present in the water mass moving toward the CVP and SWP export pumps. A negative QWEST (e.g., in October 1993 and August 1994) does not appear to have affected the timing of adult migration in the Mokelumne River when compared to years when QWEST was positive (e.g., October 1994 and August 1995).	The ten percent completion date for upstream migration at Woodbridge Dam was 10/20/94 (later migration) when QWEST was negative in August 1994 and the ten percent completion date was 9/27/95 (earlier migration) when QWEST was positive in August 1995. While these results may not be directly comparable since salmon upstream monitoring in 1995 started over one month earlier, additional analysis should be conducted to confirm the relationship between QWEST and migration. In particular, the effect of QWEST on the ten- percent upstream migration completion date for 1995 – 98 where the starting dates for the monitoring are more comparable should be analyzed. A delay in the upstream migration could translate into a later outmigration the following year where conditions later in the season may not be as favorable for salmon smolt survival.	**R11-13**

[Continued next page]

Page 5-14 EBMUD and USFWS have indicated concern about the entrainment of fry in Delta diversions after high flows. The available salvage data for the CVP and SWP, however, show that peak entrainment of juvenile chinook salmon occurs during April and May (Figure 5-3). It is likely that fry and young juvenile chinook salmon rear in the lower portion of rivers and in the Delta channels receiving the river discharge until they reach smolt size (i.e., a level of maturity that allows movement to the ocean).	Research conducted by Entrix in Winter 2000 * indicates that juvenile chinook salmon do not move into the western Mokelumne River and take up residence, but continually move downstream, growing as they migrate (Tom Taylor, Personal Communication). This means that not only smolt, but also the more fragile fry would be exposed to DW diversions. To protect the juvenile Mokelumne salmon, EBMUD suggests monitoring for the presence of salmon and practicing adaptive management techniques, such as managing location and timing of diversions so as to avoid harm to the salmon. Specific techniques of adaptive management of Delta Wetlands project operations have been identified and are available for use as necessary. *See "Proposal to develop a juvenile chinook salmon rearing in-river and Delta habitat study." Proposal prepared for CUWA by Entrix, SP Cramer and Associates and Ted Winfield and Associates, December 1999.	**R11-14**
Page 5-15 The results shown in Table 5-4 and Figure 5-4 indicate that the Delta Wetlands Project would have a minimal effect on the proportion of Mokelumne River water moving through the central and south Delta. In most years the Delta Wetlands discharge would have proportionately less Mokelumne River water than the channel receiving the discharge.	The EIR should show the temperature effects of this discharge and possible delays in adult salmon upstream migration Additional temperature monitoring and review of 10% complete migration data should be done to determine the effects of this discharge. Adaptive management of Delta Wetlands project operations to mitigate any negative effects are recommended.	**R11-15**
Page 5-16 Fish screens would be designed to meet a 0.2-fps approach velocity, avoiding direct diversion effects on juvenile chinook salmon.	Reduce the fish screen size from 5/32" to 3/32" to protect salmon fry, in accordance with NMFS Southwest Region Fish Screening Criteria for Anadromous Salmonids, dated 1997.	**R11-16**
Page 5-16 The high concentration of disoriented fish could create exceptional predator habitat by increasing prey availability. Boat docks, however, would not divert water or constrict flows and would not cause conditions expected to disorient fish.	Migration of juvenile salmon may be delayed when they encounter a boat dock or other structure and are forced to mill at the water surface in attempts to migrate past the structure. This abnormal behavior can make them more susceptible to predation. To mitigate this effect, reduce the number and change the location of the boat docks.	**R11-17**
Page 5-17 Installation of boat docks would not be expected to affect fish predator-prey interactions significantly. Pilings and shad associated with boat docks or fishing piers may be used as cover by both predator and prey fish. However, these structurally simple forms of cover attract fish species much less than more complex forms such as brush piles or aquatic plants (Savino and Stein 1982, Gotceitas and Colgan 1987, Lynch and Johnson 1989).	The boat docks would concentrate both juvenile salmon and predators, increasing their chances for interaction. Juvenile salmon encountering a boat dock may mill around before passing below the structure. To mitigate this effect, reduce the number and change the location of the boat docks. (See "Utility of Synthetic Structures for Concentrating Adult Northern Pike and Largemouth Bass".a studys by Kevin B Rogers and Eric P. Bergersen, American Fisheries society, 6/24/99)	**R11-18**

Page 5-17 The FOC terms include compensatory measures that potentially improve and increase fish habitat, such as conservation of 200 acres of shallow-water rearing and spawning habitat, habitat replacement at a 3:1 ratio, setting aside of environmental water, and contribution of funds for DFG fish and habitat management (i.e., $100 per year per additional boat berth, compensation for incidental entrainment losses, establishment of aquatic habitat conservation and environmental water funds).	Mitigation measures should be subject to review by and approval of the technical advisory committee. EBMUD should have a place on the TAC.	R11-19
Table 5-2. Dates of annual Adult Chinook Salmon Migration Past Woodbridge Dam (by percentage complete)	The table should include the ten percent completion date in order to evaluate potential delays in adult salmon upstream migration that result from increases in water temperatures from Project discharges or from negative QWEST that results from Project diversions. The 10% completion data has been provided to the environmental consultant for the RDEIR.	R11-20
Table 5-5. Comparison between Delta Wetlands Project Impacts on Fisheries in the 1995 DEIR/EIS and in the 2000 REIR/EIS	Aquatic habitat development should be located near the project islands and not downstream in Suisun Bay since shallow water habitat will need to be available when X2 is upstream. Habitat development should be reviewed and approved by Delta Wetlands Project TAC. For the benefit of Mokelumne Salmon, shallow water rearing habitat should be constructed along the migratory pathway for juvenile salmon from the lower Mokelumne River and close to the Delta Wetlands project island. Desirable characteristics of this type of habitat include: • Shallow water (generally < 6 feet deep) • Structural diversity (includes large woody debris, diverse substrate, varying water velocities, vegetation cover) • Floodplain inundation (typically January through April, with water inundation in pulses so levels rise and fall gradually and maintain flow) • Suitable water temperatures (generally < 20 C) • Connection to river (for fish ingress and egress) (Source: Peter Moyle and Steve Cramer, personal communication)	R11-21
Table 5-5, Impact F-4: Potential Increase in the Mortality of Chinook Salmon Resulting from the Indirect Effects of Delta Wetlands Project Diversions and Discharges on Flow(s). The RDEIR states that the project impacts would be less than significant based on the inclusion of project elements identified in the biological opinions.	**General Comment:** While the Final Operations Criteria and Reasonable and Prudent Measures in the DFG, USFWS, and NMFS biological opinions provide protection for listed threatened or endangered delta smelt and winter-run chinook, the life history of these species is significantly different than fall-run chinook salmon. Because of these life history differences, mitigations for these species will not necessarily mitigate the impacts on fall-run chinook salmon. Thus, potentially significant Delta Wetlands Project impacts on fall-run chinook salmon remain.	R11-22

Table 5-5 Total Export Criteria: - Annual export of Delta Wetlands stored water will not exceed 250,000 acre-feet.	Because of the timing and location of the exports, there still could be a significant impact on Mokelumne origin salmon. A diversion preference and protocol would help mitigate negative impacts.
Table 5-5 Diversion Criteria: - Maximum X2 value limits start of Delta Wetlands diversion, September through November.	This limit does not protect juvenile Mokelumne origin salmon emigrating from December through March. A diversion preference and protocol would help mitigate negative impacts.
Table 5-5 Diversion Criteria: - Maximum X2 limits magnitude of Delta Wetlands diversion, September through March.	This limit may not protect juvenile Mokelumne origin salmon if the diversion is limited from September through December and diversions increase from January through March. A diversion preference and protocol would help mitigate negative impacts.
Table 5-5 Diversion Criteria: Delta Wetlands diversion to storage is limited by QWEST in March	While this limit provides some protection, a significant proportion of the juvenile salmon outmigration may occur in February. A diversion preference and protocol would help mitigate negative impacts.
Table 5-5 Diversion Criteria: No water is diverted, April and May	This limit will protect salmon smolts, but not fry. A diversion preference and protocol would help mitigate negative impacts
Table 5-5 Diversion Criteria: If the delta smelt fall midwater trawl index is less than 239, no diversion from February 15 through June.	This limit may benefit juvenile salmon, but a significant number of juvenile salmon fry could emigrate before this time. A diversion preference and protocol would help mitigate negative impacts.
Table 5-5 Diversion Criteria: Diversions are limited to a percentage of Delta surplus and Delta outflow (year round), and San Joaquin River (December through March) inflow.	Diversions would occur during the high outflow years which are the same years when the proportion of salmon emigrating as fry is the greatest A diversion preference and protocol would help mitigate negative impacts.
Table 5-5 Diversion Criteria: Diversions are reduced when monitoring detects presence of delta smelt, December through August.	This limit may benefit juvenile salmon, but may not be a benefit if diversions on Webb Tract through the northeastern siphon still occur. A higher impact could occur if diversions are curtailed at the southeastern siphon and increase at the northeastern siphon. A diversion preference and protocol would help mitigate negative impacts.

R11-22 cont'd

Table 5-5 Diversion Criteria: Diversions are limited if the Delta Cross Channel is closed for fish protection, November through January.	Mokelumne origin salmon are exposed to Delta Wetlands diversions regardless of the Delta Cross Channel operation. This protection measure ends at about the time when juvenile salmon emigration begins. A diversion preference and protocol would help mitigate negative impacts.
Table 5-5 Discharge Criteria: - Webb Tract discharge for export is prohibited, January through June.	This is outside the period of adult salmon upstream migration and the limit may force Delta Wetlands to discharge during the fall months when there could be a temperature impact on migrating adult salmon. Additional temperature monitoring and review of 10% complete migration data should be done to determine the effects of this discharge. Adaptive management techniques to mitigate any negative impacts are recommended.

R11-22 cont'd

ATTACHMENT B – Aqueduct Security Related Issues

Review Comments on the Delta Wetlands Revised Draft EIS/EIR: Levee and Aqueduct Security Related Issues

The Mokelumne River supplies about 95% of the water provided by EBMUD to approximately 1.2 million people in EBMUD's service area. The water is carried in an 82-mile long aqueduct of three large diameter steel pipelines running in a 100' wide right -of- way. With a maximum capacity of 325MGD, the Mokelumne Aqueducts serve as the East Bay's lifeline from Pardee Reservoir to the EBMUD service area. Security of this lifeline is one of the District's highest priorities.

The Mokelumne Aqueducts cross the Delta between Stockton and Brentwood. In the Delta, the aqueducts are buried between the San Joaquin River Crossing at Stockton and Holt, which is west of Stockton. For the remainder of the Delta Crossing, the aqueducts are elevated pipes supported on bents and piles. The aqueducts also make underground river crossings at Middle River and Old River.

The aqueducts are above ground immediately south of Bacon Island, and cross under the Middle River just to the east of Bacon Island. (Bacon Island is a proposed DW reservoir island.) Failure of a levee adjacent to the aqueducts could result in scour of the aqueduct footing and probable failure of one or more of the pipelines. The impact of an extended aqueduct outage on EBMUD's 1.2 million customers and on the economy of the service area would be significant.

For these reasons, EBMUD is concerned with the security of the levees around Bacon Island and the potential for flooding and damage to its Mokelumne Aqueducts should those levees fail; seepage onto adjacent islands, causing damage to and potential levee failure on those islands; and ensuring that Delta Wetlands Project operations are as stable and secure as they can possibly be.

EIR Citation	EBMUD Comment	
Page 6-1 Levee improvement materials would be obtained primarily from sand deposits on the project islands. Each borrow area would generally be located more than 400 feel inward from the toe of a levee so that the borrow excavation would not cause structural impacts on the levee and would be at least 2,000 feel inward from the final toe of an improved levee where a greater setback is necessary to control seepage.	Note that URSGWC report states that "A minimum of 800 to 1000 feet offset from the levee toe should be maintained for the location of borrow sites. With this offset, there is no discernable effect (based on seepage models) of the borrow areas on seepage." (Page ES-4). The report and the EIR should be reconciled.	**R11-23**
Page 6-1 The interior slopes of these perimeter levees would be protected from erosion by conventional rock revetment similar to that used on existing exterior slopes, or by other conventional systems such as soil cement or a high-density polyethylene liner. In areas where final design studies indicate that wave splash and runup could potentially erode the levee crest if it is unprotected, the levee crest would be hardened or the erosion protection facing would be extended up as a splash berm.	There is no supporting documentation for design of a "splash berm." The amount of freeboard should protect the levee from overtopping. EBMUD is concerned that soil cement is not an appropriate erosion control measure for the levee crests. Soil cement can be brittle and is subject to cracking, allowing unconstrained erosion below the soil cement cap. Also, the cap itself could pull away from the levee, leaving it unprotected. EBMUD is not aware of the effective use of polyethylene liner in a levee crest situation.	**R11-24**

ATTACHMENT B – Aqueduct Security Related Issues

EIR Citation	EBMUD Comment	
Page 6-9: Long term reliability of the proposed interceptor well system. Evidence was presented in water right hearing testimony that McDonald Island land became saturated and unfarmable after the demonstration projects were completed. DW geotechnical consultant Ed Hultgren testified, however that the relief wells became less effective with time as they became clogged with silt. Hultgren added that the demonstration wells were constructed for the demonstration project only, not for long-term use, and that when the demonstration projects were complete, the wells were not maintained.	EBMUD is concerned that the interceptor well systems have only been tested in demonstration tests conducted over ten years ago, and then for only two days. After running the tests for two days, the wells were allowed to silt up, and became less effective. Measures to prevent or eliminate siltation from clogging the wells have not been tested. The test case only proves that interceptor wells silt up.	**R11-25**
Page 6-10: Adequacy and effectiveness of the proposed seepage-monitoring program. Delta Wetlands has proposed a monitoring program to ensure that there is no seepage onto adjacent islands…	An unbiased third party or a committee including Delta Wetlands and other interested parties should perform monitoring of the seepage (Hereinafter "Neutral Monitoring Entity"). Data from all monitoring wells should be made available to members of the entity. All seepage related actions should be reviewed and approved by the entity. Other responsibilities, authorities, and actions of this Neutral Monitoring Entity should be determined.	**R11-26**
Page 6-11 Adequacy of Borrow Area Setbacks The modeling showed that setting the borrow area back 800 feet from the levee in accordance with USACE standards would result in not effects (i.e., no additional benefit) on seepage conditions or operation of the interceptor well system.	Note that URSGWC report states that "A minimum of 800 to 1000 feet offset from the levee toe should be maintained for the location of borrow sites. With this offset, there is no discernable effect (based on seepage models) of the borrow areas on seepage". (Page ES-4). The report and the EIR should be reconciled.	**R11-27**
Page 6-14: Effects of Delta Wetlands Operations on Levee Stability: Independent review of levee stability issues by URSGWC verified that the Delta Wetlands' proposed levee improvements would increase the long-term FS toward the reservoir islands in comparison with existing conditions but determined that the long-term FS toward the slough would decrease. The URSGWC evaluation also found that, compared with existing conditions, the FS toward the reservoir islands would decrease for the end of construction case and the sudden drawdown condition.	Factors of Safety, either long term or short term, should not be allowed to decrease under the DW project. At a minimum, Corps of Engineers standards (and DSOD standards, if applicable) should be met.	**R11-28**
Page 6-14 Effect of interceptor well system on levee stability. A high rate of continuous pumping in the interceptor wells can result in the migration of fine materials from the sand aquifer, which can cause internal erosion or piping in the levee material and over time lead to weakened levee foundations and potential settlement and stability problems… Delta wetlands may be required to identify the criteria by which they would judge when and interceptor well would need to be replaced	Flow meters should be installed on all interceptor wells to continually monitor performance Replacement criteria should be in the purview of the Neutral Monitoring Entity. Any weakening of the levee due to interceptor wells should be carefully monitored and mitigated for.	**R11-29**

ATTACHMENT B – Aqueduct Security Related Issues

EIR Citation	EBMUD Comment	
Page 6-16 Potential damages to adjacent Islands in the event of a reservoir island levee failure. The maximum velocity on the opposite bank would be approximately 16 fps for 30-40 minutes. It is expected that the riprapped levee would be able to withstand these velocities although floating structures and moored boats might be damaged.	DW should confirm that all levees on banks opposite the reservoir islands are riprapped to the extent that they could withstand the expected sustained velocity. EBMUD is particularly concerned with levees on islands on EBMUD's "critical perimeter" at the southern end of Bacon Island, that is: Palm Tract, Orwood Tract, Woodward Island and Lower Jones Tract.	**R11-30**
Page 6-22 Potential levee failure on Delta Wetlands project islands during Seismic Activity By improving the reservoir island levees, the stability of reservoir island levee slopes under seismic conditions would increase toward the reservoir island and would decrease toward the slough. Results of the dynamic stability analysis concluded that as much as 4 feet of levee deformation could occur under seismic conditions. This impact is considered significant.	The static Factor of Safety described on page 6-21 is not sufficient for Earthquake loading. The EIR does not specify how DW plans to address the estimated 4 feet of levee deformation calculated. The 4' of expected deformation could mean catastrophic failure of the levees. The proposed mitigation ("Adopt final levee design that achieves recommended factor of safety and reduces the risk of Catastrophic levee failure") does not reduce the impact of 4' deformation to a less than significant level.	**R11-31**
Additional concerns, not mentioned in EIR	Delta Wetlands island flooding and draining activities may also have levee stability implications. Specifically, the location of the Bacon island pumping plant and discharge structure may produce increases in river and slough channel velocities over those which presently occur. This will result in more erosion, under cutting and scour on the waterside of adjacent levees, and at the Mokelumne Aqueduct river crossings at Middle River. EBMUD recommends hydrographic and bathymetric studies of the river crossings be performed prior to construction of the DW project. Subsequent studies after project operations begin will determine the extent of project related erosion. DW should repair areas of additional erosion, undercutting, or scour that are identified.	**R11-32**
URSGWC Report, page ES-4: The need for monitoring and maintaining compliance with significance criteria is essential and must be carefully adopted and maintained.	EBMUD agrees. The issue of significance criteria needs further examination. Action plans based on triggers need to be fully developed. All actions should be reviewed and approved by the Neutral Monitoring Entity. See comments under "significance standards" below.	**R11-33**
URSGWC Report, page ES-6: The seepage mitigation design proposed by DW appears appropriate and has the potential to be effective, provided that • The interceptor well system is appropriately designed, constructed, and operated. • The monitoring system consisting of seepage monitoring wells and background wills is appropriately designed, constructed and operated, and • The significance criteria are rigorously applied and continually updated based on experience.	A Neutral Monitoring Entity and representatives from adjacent islands, reclamation districts and EBMUD, should be informed of monitoring data, and be able to initiate response actions as necessary. The spacing of the interceptor wells should be designed in accordance with geotechnical data gathered during the detailed design phase. The final spacing should be determined during construction and initial project start up to assure that the drawdown capability of the interceptor wells performs as designed.	**R11-34**

ATTACHMENT B – Aqueduct Security Related Issues

EIR Citation	EBMUD Comment	
URSGWC Report, page ES-6: The levee strengthening conceptually proposed by DW appears appropriate, except that measures need to be developed to improve the stability of the raised levees toward the slough.	Measures to improve the stability of the levees toward the slough have not been presented in the EIR. The Factor of Safety on the slough side is reduced from current conditions. Without additional measures, potential for levee failure is increased.	**R11-35**
URSGWC Report, page ES-7: In particular, the design construction, and operation of extraction wells will be critical to maximize the reliability of the seepage control system. It will also minimize the possibility of flushing fine particles out of the levee foundation, which could overtime lead to weakened levee foundations and potential settlement and stability problems.	The potential problem of "sand boils" and related levee instability in the areas of the interceptor wells has not been addressed. Also, the potential for "silting up" of the interceptor wells, leading to reduced capacity to relieve seepage has not been fully addressed.	**R11-36**
URSGWC Report, Page 2.3, Section 2.2.3: The pump test on Holland Island was conducted from April 24 through April 26, 1989… the pump test on McDonald Island was performed from August 15 through 16, 1989… **Page 2.4** Following the McDonald Island drawdown tests, there was some question regarding the long term effectiveness of the interceptor will system… Mr. Hultgren explained that the wells were not designed and built for long-term operation, and they were not maintained once the test program was completed.	In the 10 years since these draw down tests were performed, no additional data on long term reliability, need for maintenance, or feasibility of maintenance on interceptor wells has been performed. EBMUD questions the long-term viability of these wells, particularly with no financial guarantee built in to the system. If wells fail, seepage onto adjacent islands and levees will increase, potentially leading to instability of the levees or flooding of the islands.	**R11-37**
URSGWC Report, Page 2-17, section 2.4.1, Seepage Monitoring system: The purpose of the monitoring wells is to provide an early detection on seepage caused by the project…. A Spacing of 1500 to 2000 feet on neighboring islands to closely monitor a continuous sand aquifer that underlies both the DW project and neighboring islands. A maximum spacing of 1000 feet at critical sections.	To protect the integrity of its three main aqueducts, EBMUD considers the entire southern perimeter of Bacon Island (where it is adjacent to Palm Tract, Orwood tract, Woodward Tract and Lower Jones Tract) to be a "critical perimeter." A maximum spacing of monitoring wells of 500' along this perimeter would be required.	**R11-38**

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EIR Citation	EBMUD Comment	
URSGWC Report, Page 2-17, Section 2.4.1, Significance Standards: DW proposed seepage performance standards or significance standards to identify net seepage increases in the neighboring islands attributable to the reservoir islands. The data collected from the monitoring network will be used for application of the significance standards. If the data show exceedance of the significance standards, DW proposes to trigger seepage control measures to control the increased seepage. Data collection from the piezometers will commence at least one year prior to filling of reservoirs.	EBMUD has several main points with regards to the significance criteria. • Data collection should not be limited to one year. According to the report, ten years of data is available from existing monitoring wells. In addition, new monitoring wells should be installed in the first year of the 4-6 year construction period. All the existing and new data should also be considered in establishing the baseline. • Actions in response to exceedance of standards are not stated. • Neutral Monitoring Entity should review actions. • The groundwater level in each adjacent monitoring well should be compared to a known level of background monitoring wells, under any given condition. (E.g. When the background groundwater level is at a certain elevation pre project, the adjacent well should show the same level it was at pre-project) • Annual average groundwater levels should not be used as a basis for comparison, as this is imprecise data, which masks the effect of tidal action and other variability in local groundwater levels. More precise and locally relevant data should be used as a basis for comparison. • The leeway of +1 foot over two standard deviations is excessive. (See URSGWC report Section 2.4.3)	**R11-39**
URSGWC report, Page 2-21, Section 2.5.1, Long Term reliability of Proposed Well System: ...In summary, therefore, long term operability of the individual wells and reliability of power supply are expected to be the main potential sources of inadequate system performance. We believe that rigorous well O&M and consideration of standby power will provide high likelihood of long-term system reliability.	The EIR does not mention standby power, and does not discuss in detail the O&M procedures.	**R11-40**
URSGWC report, Page 3-1, Slope Stability. The main objective of the stability analysis was to evaluate the proposed levee strengthening scheme for Webb Tract and Bacon Island in the DW project.	It does not appear that the report evaluated the effect on the levee of a raised phreatic surface due to water on both sides of the levee when the reservoir is full. Has the potential for chunks of the levee being lifted by rising groundwater on both sides, and "floated away" been investigated? This has happened in the recent past. What measures will be implemented to avoid this?	**R11-41**

ATTACHMENT B – Aqueduct Security Related Issues

EIR Citation	EBMUD Comment	
URSGWC Report, Page 3-4, Section 3.3.3, Water Table Elevations General Note	The water surface elevations for the 100-year floodplain were not considered in the levee stability analysis. It is important, and typical in a design of this scope, that the analysis address the most critical case rather than only what is considered representatively critical. Also, the wind runup wave height should be considered at the 100-year flood-plain level.	**R11-42**
URSGWC Report , page 3-5, Section 3.3.4, Soil Parameters General note.	The report uses effective stress strength parameters for the peat and organic soils to calculate long-term levee stability. We recommend that the report also use undrained strength analysis parameters for the peat and organic soils to calculate long term stability because the effective stress strength parameters may not account for pore pressure increases that occur during shearing which result in unconservatively higher FOS's.	**R11-43**
URSGWC Report, Section three, Slope Stability Issues, Tables 3.57 and 3.56	The report states that the design is inadequate in meeting the criteria set forth by the USACE and DSOD. The project should not be approved unless it is demonstrated that these design criteria (DSOD only in the case that the reservoir water level is 6' or more above MSL) can be met and a stable levee will be constructed.	**R11-44**

East Bay Municipal Utility District

R11-1. Chapter 5 of the 2000 REIR/EIS provides an assessment of impacts on chinook salmon that originate from the Mokelumne River (Chapter 3F of FEIS Volume 1). The 1995 DEIR/EIS and the 2000 REIR/EIS both used the best available information for the impact assessment. The data did not support a conclusion that Delta Wetlands Project operations would significantly affect Mokelumne River juvenile or adult chinook salmon. The commenter argues that the proximity of Webb Tract to the north and south forks of the Mokelumne River justifies conducting a separate, detailed assessment of project impacts on Mokelumne River fish. This conclusion is not supported. Chinook salmon from the Mokelumne River would be exposed to the same project effects as chinook salmon from the San Joaquin River and those from the Sacramento River that move down Georgiana Slough (and the DCC when the gates are open).

As described in Chapter 5 of the 2000 REIR/EIS (FEIS Volume 1, Chapter 3F), several FOC terms limit effects of the Delta Wetlands Project on Delta flows during February through June, the period of concern identified by the commenter. As a result, the following terms reduce project effects on outmigrating juvenile chinook salmon:

Delta Wetlands is prohibited from diverting water in April and May.

Diversions are limited during all other months to a percentage of surplus flows and a percentage of outflow, and are also limited to a percentage of San Joaquin River flow during January through March.

Several FOC terms limit indirect effects of Delta Wetlands project operations on flows in February and March by further limiting diversions during those months based on X2 position, change in X2, March QWEST criteria, and DCC closure.

Delta Wetlands is prohibited from discharging water for export from Webb Tract in January through June.

These measures do not redirect impacts or create conditions that specifically affect chinook salmon of Mokelumne River origin.

Additionally, Delta Wetlands is required by the FOC to install fish screens that meet an approach-velocity criterion of 0.2 fps. This combination of measures reduces potential project effects on Mokelumne River juvenile chinook salmon to a less-than-significant level. See Master Response 4, “Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions”, for details about these terms.

Despite the protections provided by the FOC, Delta Wetlands and EBMUD negotiated a protest dismissal agreement describing additional measures that Delta Wetlands would take to address EBMUD’s concerns about project effects on Mokelumne River salmon. The agreement, submitted to the SWRCB in October 2000, is included in the appendix to this

volume. Attachment A of the agreement specifies that Delta Wetlands will implement the following measures to provide further protection against potential project effects on Mokelumne River fisheries:

Restrict diversions from the northeastern siphon station on Webb Tract to only those times when the southeastern siphon station is operating at full capacity or when certain other conditions are met.

Remove existing agricultural siphons from Bouldin Island and Webb Tract and limit the total number of siphons on Bouldin and Webb Tract under the proposed project.

Limit the number of boat docks added to Bouldin Island and Webb Tract.

Conduct a fisheries monitoring program at Webb Tract.

The SWRCB included some of the terms of the protest dismissal agreement in the terms and conditions of the Delta Wetlands water right permit.

R11-2. See responses to EBMUD's detailed comments (R11-23 through R11-44) below.

Delta Wetlands and EBMUD submitted a protest dismissal agreement to the SWRCB during the water right hearing that acknowledges the importance of the Mokelumne Aqueduct and outlines measures to reduce risk to this structure.

R11-3. The commenter is correct. The text on page ES-4 of the 2000 REIR/EIS has been revised as follows:

> The East Bay Municipal Utility District (EBMUD) and DFG raised several issues about project effects on ~~listed~~ fish species.

The 2000 REIR/EIS provided an assessment of project effects on fall-run chinook salmon (see pages 5-12 and 5-13 [pages 3F-54 and 3F-55 of FEIS Volume 1).

R11-4. The reference to "Mokelumne River spring-run chinook salmon" under "Fisheries" on page ES-6 of the 2000 REIR/EIS has been revised as follows:

> It also discusses new listings of fish species and evaluates new information on spring-run chinook salmon occurrence provided by DFG, data on Mokelumne River ~~spring-run~~ fall-run chinook salmon provided by EBMUD, and new information regarding potential increases in predation with the construction of Delta Wetlands boat docks and other facilities.

The occurrence of spring-run chinook salmon, winter-run chinook salmon, steelhead, splittail, and delta smelt overlaps the occurrence of fall-run chinook salmon in the Delta. The FOC and the biological opinion RPMs include measures that limit Delta Wetlands

operations, and subsequent effects on Delta habitat conditions and chinook salmon, throughout the period when adult and juvenile fall-run chinook salmon could be present. With the FOC and the RPMs incorporated into the proposed project, impacts on fall-run chinook salmon, including those originating in the Mokelumne River, are less than significant.

R11-5. Juvenile chinook salmon released in the Sacramento River migrate either down the Sacramento River or through the DCC into the central Delta. The survival rate has been found to be higher for those fish remaining in the Sacramento River than for those that enter the DCC–central Delta pathway. However, the available data do not strongly support the conclusion that the lower survival rate is the result of exports and diversions (Newman and Rice 1997).

The FOC and RPMs include terms to minimize the effect of exposure to Delta Wetlands diversions. These measures reduce the potential impact on chinook salmon that originate in the Mokelumne River to a less-than-significant level.

Available information indicates that only a portion of the salmon produced in the Mokelumne hatchery are marked, few naturally produced salmon are marked, and the probability of capturing marked Mokelumne River fish is low (based on recoveries at the CVP and SWP fish protection facilities of less than 0.02% of the number released). Monitoring specifically for the presence of Mokelumne River chinook salmon, therefore, would have minimal, if any, real-time management value.

The protest dismissal agreement between Delta Wetlands and EBMUD requires that Delta Wetlands implement a fishery monitoring program when Webb Tract diversions to storage from the northeastern siphon station on the San Joaquin River exceed 50 cfs between January 1 and June 30. The monitoring program is described in Attachment A of the agreement (see the appendix to this volume).

R11-6. As required in the FOC, USFWS will approve the easement for 200 acres of shallow-water aquatic habitat and the management plan for the habitat. EBMUD's request for conservation of habitat along the Mokelumne River has been noted.

R11-7. Establishment of the fund is specified in the DFG biological opinion; use of the fund would be at the direction only of DFG. As stated in RPM 2.0, section 2.1, "The Fund shall exclusively benefit and be controlled by the DFG". Therefore, DFG would determine whether the Technical Advisory Committee would have any role in reviewing or approving the use of the fund. As part of the protest dismissal agreement, Delta Wetlands has agreed to notify DFG that EBMUD may participate on the Technical Advisory Committee and should be provided notice of all committee meetings and discussions.

R11-8. Under the terms of the FOC, use of the aquatic habitat restoration funds will be at the discretion of the resource agencies (e.g., DFG Bay-Delta office). These monies will be

used to the fullest extent possible to plan and implement actions that improve habitat for the target species in the Bay-Delta estuary.

R11-9. Mr. Frank Wernette of DFG in Stockton provided the modified model to the SWRCB during summer 1999. He did not provide a reference citation other than indicating that USFWS updated its fall-run chinook salmon model so it could be used to assess effects on late-fall-, spring-, and winter-run chinook salmon. The SWRCB provided the information to the preparers of the NEPA and CEQA analysis.

R11-10. See response to Comment R11-5 regarding mortality attributable to exports and Delta Wetlands diversions in the central Delta, and response to Comment B6-60 regarding design of fish screens.

R11-11. Mokelumne River chinook salmon probably migrate up the San Joaquin River channel and subsequently into the Mokelumne River channel. Stored water from Webb Tract would be discharged on the south side of the island, not to the San Joaquin River channel. Given the location of the discharge, the volume of tidal flow in the San Joaquin River channel, and the implementation of the water temperature mitigation measures described in the FOC, temperature changes in the San Joaquin River channel are likely to be unmeasurable. Adult chinook salmon returning to the Mokelumne River would not be affected.

R11-12. The date that 10% of migrating adults complete migration past Woodbridge Dam has been reviewed relative to potential relationships to QWEST. The conclusion is the same as discussed in Chapter 5 of the 2000 REIR/EIS (Chapter 3F of FEIS Volume 1) for the 50% and 90% completion dates of adult migration: QWEST does not clearly affect migration dates.

For example, in 1998, average QWEST in August was 5,400 cfs and the 10% completion date was October 10, while in 1995, average August QWEST was 300 cfs (varying from less than -1,000 cfs to more than 2,000 cfs) and the 10% completion date was September 28. The relationship between the 50% completion date and flow in the Mokelumne River in August has also been evaluated; the results showed that earlier dates of 50% completion were related somewhat to higher flow in the Mokelumne River. For example, in 1994 the average Mokelumne River flow in August was 40 cfs and the 50% completion date was November 7, and in 1995, the average Mokelumne River flow in August was 900 cfs and the 50% completion date was October 28.

In addition, the 1% completion date is related somewhat to the size of the run; earlier completion dates are associated with larger runs. The 1% completion date is also correlated with the 10% completion date. Data on flows and the migration of Mokelumne River chinook salmon can be evaluated in many different ways, but the causal mechanisms for the relationships found through such evaluation need to be considered carefully. More information is required before any conclusive relationship can be ascertained. One missing component is the date when adult chinook salmon return to the

estuary. Variability in completion dates may be related to the timing of return to the estuary, which in turn may be related to ocean conditions or some other factor.

In summary, the completion dates of adult fish migration are not clearly related to flow conditions. The available data do indicate that Delta Wetlands Project operations would affect the timing of migration of adult chinook salmon. This finding is consistent with the conclusion stated in the 2000 REIR/EIS.

R11-13. See response to Comment R11-12.

R11-14. The conclusion that juvenile salmon continually move downstream in the Delta and grow as they migrate is based on data that have not been made available to the general scientific community. The data also do not appear to address the effects of diversions on survival of juvenile chinook salmon in the Delta, especially fry. The analysis in the 2000 REIR/EIS is based on the best available information. With the FOC and RPMs incorporated into the proposed project, effects on juvenile chinook salmon are less than significant; see Master Response 4, "Impacts on Fisheries Identified in the 1995 DEIR/EIS and Adoption of Biological Opinions", for information about protective measures for juvenile chinook salmon included in the FOC and RPMs. See also response to Comment R11-5 above regarding monitoring for Mokelumne River chinook salmon.

R11-15. See response to Comment R11-12 regarding the data on 10% completion of adult migration; see response to Comment R11-11 for an additional discussion of potential temperature-related effects on adult migration.

R11-16. See response to Comment B6-60 regarding design criteria for fish screens.

R11-17. See response to Comment B7-64 regarding the potential for predation at the Delta Wetlands facilities and the issue of reverse and bypass flows. A new mitigation measure is proposed to reduce the number of boat slips that Delta Wetlands may construct; this measure is described under "Additional Mitigation of Potential Impacts: Reduction in Boat Slips at Recreation Facilities" in Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

Additionally, the protest dismissal agreement between Delta Wetlands and EBMUD establishes limits on the number of new boat docks that can be constructed on the exterior of Bouldin Island and Webb Tract. See Attachment A of the Delta Wetlands–EBMUD agreement, which is included in the appendix to this volume.

R11-18. See response to Comment R11-17.

R11-19. See responses to Comments R11-6, R11-7, and R11-8.

R11-20. The 10% completion dates are as follows:

1993, October 22;
1994, October 21;
1995, September 28;
1996, October 18;
1997, October 15; and
1998, October 10.

As discussed in response to Comment R11-12, the 10% completion dates of adult migration are not clearly related to flow conditions. The available data do indicate that Delta Wetlands Project operations would affect the timing of migration of adult chinook salmon. This finding is consistent with the conclusion stated in the 2000 REIR/EIS.

R11-21. See response to Comment R11-6.

R11-22. The FOC and RPMs limit Delta Wetlands diversions to ensure that the project will result in less-than-significant impacts on fish species. The diversion and discharge constraints will minimize effects of the project on juvenile chinook salmon in the Delta, including fry and smolt.

The occurrence of spring-run chinook salmon, winter-run chinook salmon, steelhead, splittail, and delta smelt overlaps the occurrence of fall-run chinook salmon in the Delta. The FOC and the biological opinion RPMs include measures that limit Delta Wetlands operations, and subsequent effects on Delta habitat conditions and chinook salmon, throughout the period when adult and juvenile fall-run chinook salmon could be present. With the FOC and RPMs incorporated into the proposed project, effects on fall-run chinook salmon, including those that originate in the Mokelumne River, are less than significant.

Exposure of juvenile chinook salmon to the Delta Wetlands diversion on the north side of Webb Tract would be minimal given the size of the San Joaquin River channel, the amount of tidal flow, the low approach velocity (0.2 fps) at the screen face of Delta Wetlands siphons, and the bypass flow provided by tidal and net Delta channel flow. The fish screens and diversion facilities are not expected to result in the concentration of juvenile salmonids and other fish species.

The FOC include several restrictions on operations during the January–March period to minimize effects on juvenile chinook salmon. In February and March, the maximum percentage of surplus water available for Delta Wetlands diversion would be limited to 75% and 50%, respectively, down from 90% allowed in January. Delta Wetlands diversions are limited to 15% of Delta outflow during February and March, compared with 25% in November and December. Delta Wetlands diversions are limited to 50% of San Joaquin River flow during March, compared with 125% from December through February. All the diversion limits are dependent on a FMWT index for delta smelt that is greater than 239. If the delta smelt index is less than 239, diversions would not be allowed

from February 15 through June. See the FOC in Appendix B of the 2000 REIR/EIS for details.

See response to Comment R11-12 regarding the data on 10% completion dates of adult migration; see response to Comment R11-11 for an additional discussion of potential temperature-related effects on adult migration.

R11-23. The text on page 6-1 of the 2000 REIR/EIS (page 3D-22 in Chapter 3D of FEIS Volume 1) referenced by the commenter describes the criteria for borrow sites proposed by Delta Wetlands in 1995 (see also Chapter 3D). These criteria have since been revised based on the results of the seepage analysis presented in the 2000 REIR/EIS. The borrow area setback recommended in Appendix H is presented on page 6-11 of the 2000 REIR/EIS (see FEIS Volume 1, page 3D-31). See also response to Comment R11-27 below.

R11-24. The erosion protection methods used on the interior island slopes is subject to final design. During the water right hearing, Delta Wetlands representatives testified that Delta Wetlands will use conventional design procedures and routine protection systems to protect the levees against erosion. Various shore protection schemes such as riprap and soil cement, as well as combinations of systems, would be considered in the final levee design.

R11-25. The 2000 REIR/EIS states that regular performance monitoring, maintenance, and "redevelopment" (cleaning) of the wells will be required to ensure the long-term effectiveness of the proposed interceptor-well system. See Section 2.5 of Appendix H for more information.

Additionally, the Delta Wetlands–EBMUD protest dismissal agreement describes routine operations in the Seepage Control Plan as follows:

> [Delta Wetlands] will continually evaluate the efficiency of the interceptor wells to verify that there is sufficient additional capacity to allow the pool elevation to continue to be raised. If the efficiency of a well drops off such that the ability of the well to pump greater volumes of water is in question, [Delta Wetlands] will redevelop the well to improve its efficiency prior to approaching the well's limits. If additional capacity is not readily available from an existing well, a new well can be drilled to increase the pumping capacity at the reservoir island's perimeter.
>
> . . . During the period with little to no water storage, a thorough evaluation of the efficiency of the wells will be undertaken by [Delta Wetlands] to identify those wells that may show signs of decreasing efficiency and may be susceptible to overstressing during the following season's storage cycle. The need for additional wells will also be evaluated. To the extent practical, redevelopment of existing wells and installation of additional wells will occur during the off-season.

R11-26. See responses to Comments C6-2 and C17-4.

The protest dismissal agreement submitted by Delta Wetlands and EBMUD during the water right hearing proposes a neutral technical review committee, identified in the agreement as the "Reservoir Island Monitoring and Action Board (MAB)". A copy of the agreement is provided in the appendix to this volume.

R11-27. The last sentence of the paragraph under "Adequacy of Borrow-Area Setbacks" on page 6-11 of the 2000 REIR/EIS (see page 3D-3I of FEIS Volume 1) has been modified as follows:

> The modeling showed that setting the borrow area back a minimum of 800 feet from the levee in accordance with USACE standards would result in no effects ~~(i.e., no additional benefit)~~ on seepage conditions or operation of the interceptor-well system (Section 2.3 of Appendix H).

R11-28. See response to Comment R6-17 above.

R11-29. Flow meters are one option for monitoring the effectiveness of the interceptor well system. See response to Comment R11-25 for more information on evaluating the efficiency of the wells.

R11-30. Because the potential risk of a levee failure is extremely low, the impact is considered less than significant; no mitigation, such as evaluation of the riprap condition on banks opposite the reservoir islands, is required. See also response to Comment R6-15.

R11-31. When potential changes in levee stability are evaluated, conditions under the project are compared with existing conditions. Under existing conditions, the levees are subject to deformation during seismic activity. The same is true under project conditions. The mitigation measure described in Chapter 6 of the 2000 REIR/EIS (see Chapter 3D of FEIS Volume 1) and referenced by the commenter would ensure that long-term levee stability would be equal to or greater than stability under existing conditions. When this mitigation measure is applied, the risk of levee failure under seismic conditions would be less than or equal to the risk under existing conditions. See also responses to Comments R2-25, R2-26, and R2-27 regarding the seismic stability analysis and potential for liquefaction.

R11-32. See response to Comment C17-5.

R11-33. See responses to Comments C6-2 and C17-4.

The protest dismissal agreement submitted by Delta Wetlands and EBMUD during the water right hearing proposes a neutral technical review committee, identified in the agreement as the "Reservoir Island Monitoring and Action Board (MAB)". A copy of the agreement is provided in the appendix to this volume.

R11-34. The commenter is correct in stating that the final spacing of the interceptor wells would be determined during the final design. See response to Comment C6-2 regarding the neutral monitoring entity and dissemination of information.

R11-35. See response to Comment R6-12.

R11-36. As described in Chapter 2, "Delta Wetlands Project Alternatives", Delta Wetlands would conduct routine inspections and maintenance of the reservoir island levees. Additional information about weekly levee inspections is provided in Chapter 3D under "Postconstruction Monitoring and Maintenance" (FEIS Volume 1, page 3D-13). See response to Comment R11-25 regarding the potential for "silting up" of the interceptor wells.

R11-37. The seepage monitoring and control system would be designed to maximize the potential for long-term viability of the interceptor well system. The technical analysis presented in Appendix H found that the proposed well system can be expected to operate reliably on a long-term basis, presuming that:

the specific design at each well location is adequate and appropriate,
appropriate redundant systems are in place in case of equipment failure, and
well systems are monitored and are maintained properly.

If the well system fails and seepage levels on adjacent islands increase above the performance standards, Delta Wetlands would be required to cease diversions onto the project islands and, in extreme cases, cease reservoir operations.

R11-38. See response to Comment C6-1 regarding the spacing of monitoring wells.

R11-39. The following responses correspond to each bullet point about the seepage performance criteria in this comment.

See response to Comment R10-16 regarding the collection of baseline data.

See response to Comment E14-10 regarding possible actions to be taken in response to exceedance of standards.

See response to Comment C6-2 regarding a neutral review committee.

Each monitoring well would be located in a unique location and would be subject to local conditions associated with variations in the porosity of the levee, irrigation and drainage practices, and other local influences. Each seepage monitoring well would be compared both to its own historical performance and to the average of all background monitoring wells. These two comparisons address both the local and regional influences, respectively.

Storing water in a reservoir does not induce tidal variations in groundwater levels. The groundwater monitoring program is intended to mask the influence of daily tides by recording the groundwater level at least hourly and computing the mean groundwater level for each monitoring well on each day. The "daily mean" is intended to represent the groundwater level with the tidal impacts neutralized. Other major influences in groundwater levels not induced by water storage in a reservoir include local rainfall; variations in river stages resulting from upstream runoff; evapotranspiration; and irrigation and drainage for specific crops. These nonreservoir influences on groundwater levels have annual cycles. Computing the annual variation of groundwater levels around the annual mean at each well location provides a measure of site-specific variations independent of those that may be caused by seepage from a reservoir. Once Delta Wetlands begins to store water in the reservoirs, variations in the groundwater levels can be compared to variations recorded in prior years so that changes in local conditions can be monitored. See also response to Comment C17-4 regarding taking into account seasonal variations in groundwater levels.

See response to Comment R10-18 regarding the recommended leeway.

R11-40. Discussions with Delta Wetlands' engineers indicate that standby power and other redundancies would be included in the final design for the seepage control system; the need for and appropriate methods used to provide standby power will be assessed during final design for the seepage control system (Hultgren pers. comm.). As described in the Delta Wetlands–EBMUD protest dismissal agreement, the reservoir island design review board (DRB) would review the design of the seepage control system; the need for standby power would be considered during its review. Additionally, after reservoir operations begin, the MAB would review operation of the seepage control system and may make recommendations about standby power or redundant facilities in response to operating conditions.

R11-41. The levee analysis takes into consideration the raised phreatic surface under the project island levees when water is stored on the reservoir islands. The most critical levee condition is when the reservoir is high and the adjacent channel is low; this condition was evaluated in Appendix H. The wide stability berms at the toes of the levees would provide sufficient weight to restrain the peat over the short distance where differential heads may be highest. Seep ditches beyond the toes of the wide berms would relieve excess head. The potential for "floating levee bits" would be evaluated during final design, but it is not expected to be a substantial issue.

R11-42. See response to Comment R6-10.

R11-43. See response to Comment R6-14.

R11-44. See response to Comment R6-17.

Letter R12

EAST BAY REGIONAL PARKS FOR THE FUTURE PARK DISTRICT

BOARD OF DIRECTORS
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Pat O'Brien
General Manager

July 28, 2000

Mr. Jim Sutton
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

Subject: Comments on Delta Wetlands Project Revised Draft EIR/EIS

Dear Mr. Sutton:

Thank you for providing the East Bay Regional Park District ("District") with a copy of the revised draft Environmental Impact Report/Environmental Impact Statement for the Delta Wetlands Project. The following are the District's comments on the revised draft EIR/EIS.

The District reviewed the draft EIR/EIS in 1995 and had no comments at that time. The 1995 document identified that private recreational improvements may take place as part of the project, however there would be no new public facilities contemplated. Since that time, CALFED has indicated some interest in possibly taking over this project, in which case public recreation may be included in a publically-owned project. Should such events occur, the District would be interested in promoting the establishment of public recreational facilities in the project area.

In 1997, the District adopted a new Master Plan which identified our existing and potential parklands and Regional Trails in Alameda and Contra Costa Counties. I have enclosed a copy of our Master Plan and accompanying map for your review and information. The enclosed map identifies several existing and proposed regional park and trail facilities that could be affected by the proposed project, including Big Break Regional Shoreline in Oakley, a proposed "Delta Recreation" park on Jersey Island, a "Delta Access" park on the Orwood Tract, and several proposed regional trails which would run between these three parks and other existing District facilities. Given the size and complexity of the proposed project, it is likely that some of these facilities could be developed as part of or mitigation for a future publically-funded project. **R12-1**

Sincerely,

Brad Olson
Environmental Specialist

cc. Margit Arambaru, Delta Protection Commission
Steve Richie, CALFED

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East Bay Regional Park District

R12-1. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, Including the CALFED Bay-Delta Program", for a discussion of the potential integration of the project into CALFED.

Letter R13

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IRONHOUSE SANITARY DISTRICT
450 Walnut Meadows Drive • P.O. Box 1105 • Oakley, CA 94561

Telephone
(925) 625-2279

July 24, 2000

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Mike Finan
1324 J Street, Room 1480
Sacramento, CA 95814-2922

RE: Comments on Delta Wetlands Draft EIR/S

Gentlemen:

Thank you for the opportunity to comment on the Delta Wetlands Revised Draft Environmental Impact Report/Statement (REIR/S) published May, 2000. As you noted at page 1-2 of the REIR/S:

> This REIR/EIS does not include formal responses to comments on the 1995 DEIR/EIS, although it does address several issues raised in those comments. Formal responses to all comments on the 1995 DEIR/EIS will be presented in the final environmental impact report/ environmental impact statement (FEIR/FEIS) on the Delta Wetlands Project along with responses to comments on this REIR/EIS. Comments submitted on the 1995 DEIR/EIS do not need to be resubmitted.

As you know, Ironhouse Sanitary District (ISD) submitted a letter dated December 21, 1995 commenting on the 1995 DEIR/EIS. After reviewing the REIR/S, ISD hereby formally resubmits the comments it made in 1995, even though it is not necessary to do so. In particular, ISD finds that the information presented in **R13-1**

Chapter 6 – Levee Stability and Seepage, does not adequately respond to Comments 2 and 3 submitted in the December 21, 1995 letter. **R13-1 cont'd**

In closing, thank you for the opportunity to comment on the Draft EIR/S. I am looking forward to your responses to ISD's comments submitted in 1995, as well as to the above comment.

Very truly yours,

David N. Bauer

David N. Bauer,
District Manager

cab\wp80
DNB\SUTTON

cc: F. Etzel, Henn & Etzel, Inc.
chron file

Ironhouse Sanitary District

R13-1. See responses to Comment Letter C15. Additionally, after the 2000 REIR/EIS was completed, Delta Wetlands and EBMUD submitted a water right protest dismissal agreement to the SWRCB. The agreement outlines a dispute resolution process that neighboring landowners could use to identify and remedy problems attributable to seepage from the reservoir islands and related problems that may be attributable to the Delta Wetlands Project.

MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Office of the General Manager

August 7, 2000

Mr. Jim Sutton
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

Mr. Mike Finan
U.S. Army Corps of Engineers, Sacramento District
Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95812-2000

Dear Messrs. Sutton and Finan:

Revised Draft Environmental Impact Report/
Environmental Impact Statement and Executive Summary for the Delta Wetlands Project

The Metropolitan Water District of Southern California (Metropolitan) has received the Revised Draft Environmental Impact Report/Environmental Impact Statement (RDEIR/S) and Executive Summary for the Delta Wetlands Project. The Delta Wetlands Project is a water storage project affecting four islands in the Sacramento-San Joaquin Delta. The proposed project would divert and store surplus water on two "reservoir" islands (Bacon Island and Webb Tract; with a combined storage capacity of 238,000 acre-feet), and convert two other islands (Bouldin Island and most of Holland Tract; "habitat" islands) from agriculture to wetland and upland wildlife habitat. In addition, private recreational facilities are proposed for all four islands. This letter contains our response as a potentially affected public agency.

Metropolitan supports water-management programs that can provide water quality improvements to Southern California, increased flexibility for Delta export operations, and increased Bay-Delta ecosystem benefits. The Delta Wetlands Project, if developed in accordance with the June 9, 2000 CALFED Framework for Action, has the potential to meet these objectives. However, we are concerned about the potential for significant adverse water quality impacts if the proposed project operations are not modified. Metropolitan assisted the California Urban Water Agencies (CUWA) in the development of its comments on the RDEIR/S and incorporates those comments herein. We look forward to the Lead Agencies addressing our concerns and developing an appropriate mitigation program to ensure that water quality is protected and improved, where possible. R14-1

700 N. Alameda Street, Los Angeles, California 90012 • Mailing address: Box 54153, Los Angeles, California 90054-0153 • Telephone (213) 217-6000

We appreciate the opportunity to provide input to your planning process and we look forward to receiving future environmental documentation on this project. Please refer any questions relating to Metropolitan's comments to Mr. Kevin Donhoff at (213) 217-6359.

Very truly yours,

Laura J. Simonek

Laura J. Simonek
Principal Environmental Specialist

KAD/dtf
s:/envpln/bay delta wetlands.doc

cc: Mr. Peter Maclaggan
California Urban Water Agency
455 Capitol Mall, Suite 705
Sacramento, CA 95814

Mr. James Easton
The Delta Wetlands Project
2295 Gateway Oaks Drive, Suite 140
Sacramento, CA 95833

Metropolitan Water District of Southern California

R14-1. See responses to Comment Letter R4.

Letter R15

Natural Heritage Institute

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Non-Profit Law and Consulting in Conservation of Natural Resources and the Global Environment

July 16, 2000

State Water Resources Control Board
Division of Water Rights
Attn: Jim Sutton
P.O. Box 2000
Sacramento, CA 95814-2000

U.S. Army Corps of Engineers, Sacramento District
Regulatory Branch
Attn: Mike Finan
1325 J Street, Room 1480
Sacramento, CA 95814-2922

RE: Comments on Revised Draft EIS/EIR for the Delta Wetlands Project

Dear Sirs:

NHI appreciates the opportunity to comment on the Delta Wetlands Project ("DW" or "Project") EIR/S. We have followed the progress of the DW Project for many years and have already commented on past iterations on several occasions.

The fundamental criterion used by NHI in evaluating new infrastructure is whether the environment will be better off with the Project than without it. We could not support previous versions of DW because the Project did not satisfy that criterion. However, the Project has become more favorable to the environment with each iteration. We now believe that the current proposal for DW operations will provide a net benefit to the environment, both to terrestrial and to aquatic species. We therefore support the Project.

The benefits to terrestrial species of DW have long been recognized. The permanent dedication of two Delta islands to habitat enhancement is very favorable. Moreover, the islands designed for storage should provide additional habitat values during much of the time, particularly in dry years. R15-1

The need to provide benefits to aquatic species has been the major stumbling block for DW until the current EIR/S. DW has now agreed with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (DFG) on a set of

regulatory constraints that will significantly reduce the direct negative impacts on fish of diversions into DW, and reduce the impacts of discharges and the rediversion of water from DW at the State and Federal export pumps.

Of course, DW will still cause some damage to fish species, even with protective regulatory standards in place. However, we see the following advantages to DW:

- Significant improvement in the long-term sustainability of the Delta. The two islands designed to hold water – Bacon and Webb – will be designed to hold water on the inside. Moreover, their levees will be strengthened considerably. As a result, we consider the probability that these islands will be permanently inundated following a catastrophic earthquake in the Delta to be significantly reduced.
- Environmental share of water produced by DW. DW will provide environmental flows between 10 % and 20% of any water delivered for export from December – June.
- Export entrainment reduction. In many years, deliveries from DW to exports would accelerate the filling of San Luis Reservoir in many years. Moving the time of San Luis filling forward in time could have major fish benefits and will reduce the draw on the CVPIA b(2) account and the Environmental Water Account (EWA) reduce export pumping to safe levels.
- Reduce pressure for less benign forms of water acquisition by water users.
- Create a favorable precedent for future water development proposals. We believe that the constraints on DW are the most environmentally protective requirements ever placed on a water project in the Central Valley. We believe that this level of environmental protection will become a standard that future water development proposals will need to match.

R15-1 cont'd

We also see several other possible future benefits associated with DW:

- Environmental Storage. DW could provide very important benefits to CALFED's Environmental Water Account (EWA). DW produces most of its water in wet years. The EWA needs water more in wet years than in dry years.
- Serve the Water Transfer Market. The market for purchases, efficiency, and groundwater storage upstream of the Delta is currently hampered by a lack of reliable export capacity in the Delta. This problem is particularly acute in wetter years. DW could provide a temporary storage site during the summer until export windows open up in the September –November period.

On balance, therefore, we believe that the environment will benefit from the successful construction of the Delta Wetlands Project.

Sincerely,

Gregory A. Thomas, President
Natural Heritage Institute

Natural Heritage Institute

R15-1. The lead agencies acknowledge this comment supporting the project.

Letter R16

Pacific Gas and Electric Company

Land Rights Office
P.O. Box 930
Stockton, CA 95201

July 31, 2000

Mr. Jim Sutton
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

Mike Finan
U.S. Army Corps of Engineers
Sacramento District Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922

RE: Delta Wetlands Project Revised DEIR / EIS

Dear Mr. Sutton:

Thank you for the opportunity to review the document noted above.

Enclosed is Pacific Gas and Electric Company's (PG&E) comments concerning Chapter 7, Natural Gas Facilities and Transmission Pipelines.

In addition to the gas transmission facilities PG&E also operates and maintains electric distribution facilities on Bacon Island. These facilities serve agricultural and residential customers on the island.

It is unknown at this time what existing facilities may be affected, either to be removed or relocated to serve proposed pumping stations. However, PG&E expects to be reimbursed for all costs associated with any rearrangement of the facilities. **R16-1**

if you have any questions please contact me at (209) 942-1650.

Sincerely,

Michael Gunby s/s Karen Price

Michael Gunby
Land Agent

CC: Frank Dauby
Todd Hogenson
Richard Moss, Esq.

Comments on Revised Draft EIR/EIS:
Delta Wetlands Project, May 2000

Chapter 7 of the Revised Draft EIR/EIS for the Delta Wetland's Project by Jones and Stokes dated May 2000 addresses the "Natural Gas Facilities and Transmission Pipelines". In general the issues associated with PG&E's existing gas transmission Line 57A and Line 57B have been included in the RDEIR and are explored in significantly greater detail then in the original EIR. There are, however, incorrect conclusions and erroneous statements within the documentation of the RDEIR that PG&E feels should be recognized and corrected.

Definition of Terms:

Internal Inspection: Internal inspection of pipelines is **not** required by either the U.S. Department of Transportation (DOT) nor the California Public Utilities Commission which are the two regulatory bodies which PG&E's gas transmission lines fall under. There are a variety of "pigs" which can be very specialized in both their design and application, however no pigs measure the resistance of electrical current from the pipe to the ground. This is done by means of above ground surveys which are performed by individuals. Specialized "In-Line-Inspection" pigs are available which perform metal loss surveys of steel gas transmission lines and are used by pipeline owners to verify the integrity of pipelines. R16-2

Load Center: The definition as stated is incorrect. In the utility business this term refers to a central control location for the daily operation of the gas pipeline system. PG&E's load centers monitor the pressure and flow of the gas at various points and can remotely operate key points to assure that the system operates within its design parameters and that all customers obtain the gas that they require.

Pipeline Balancing: The definition as stated is incorrect . This term refers to the process by which the gas utility balances the customer loads with the available supplies of natural gas. On a daily basis the entire system gas inventory must be balanced between the gas coming into the system, the gas going out of the system and that either used by customers or stored in gas storage facilities such as PG&E's McDonald Island Gas Storage Facility.

Pipeline Safety:

Although the data obtained by Jones and Stokes from the DOT Office of Pipeline Safety from 1985 through 1999 may be correct, the conclusions which are drawn from this information are seriously in error. The most significant factor in this regard is that the information obtained from the DOT OPS was incomplete. Gas R16-3

transmission pipeline operators are only required to submit reports to the DOT OPS for pipeline incidents which meet very specific criteria and thus it would appear that the number of incidents which have occurred within California over the last 14 years has been relatively small. Additionally, the California Public Utilities Commission has additional criteria for incidents that they require utilities to report which capture a far greater percentage of gas transmission incidents than the federal reporting requirements. Further, many incidents occur on PG&E's gas transmission system which are not required to be reported to any regulatory body and thus are not included in the statistics which are referenced in the DEIR, but which PG&E must adequately respond. To illustrate this point, PG&E has had a total of 7 gas transmission incidents which were DOT reportable in the two years of 1998 and 1999. In the same time period PG&E reported a total of 32 gas transmission incidents to the California Public Utilities Commission while PG&E records indicate that a total of 53 leaks and incidents occurred on our gas transmission system.

Although "modern" pipelines are statistically safer then older facilities, the operating conditions which exist in the Delta Region are some of the most challenging in California from a pipeline design, operating and maintenance perspective. Due to these conditions, PG&E continually takes pro-active steps to assure that pipeline safety incidents do not occur on our gas transmission system. For example, specifically on Line 57B, PG&E replaced a 22 inch fitting and adjacent pipe in 1993 as a result of strain which had accumulated at the foot of the McDonald Island Levee adjacent to Latham Slough. This strain was detected by the use of sophisticated smart pig technology and subsequent non-linear finite element analysis of the pipeline at key locations. We did not wait for the line to fail before taking appropriate action. We were able to discover this situation prior to potential failure by our monitoring of the pipeline and all the levee crossings between McDonald Island and Brentwood Terminal. We have also replaced various sections of Line 57B since its original installation in order to avoid having a pipeline failure. PG&E continues to feel strongly that the potential impact to our gas transmission Line 57A and Line 57B resulting from the Delta Wetland's project is very significant by increasing the risk of failure and that any conclusion otherwise is based on insufficient information or lack of understanding of pipeline design and operating conditions. PG&E's excellent safety record in regards to the operation of gas transmission facilities in this are should not be used to downplay the risk of these facilities nor their potential for catastrophic failure. **R16-3 cont'd**

Natural Gas Service:

The RDEIR/EIS states that the McDonald Island Gas Storage Field is used primarily to supply gas to the Bay Area and Sacramento/Stockton when other resources are inadequate to meet demand. This statement is incorrect as PG&E has stated several times that the M.I. Gas Storage Facility is an integral part of **R16-4**

PG&E's system and is used the entire year by various marketers and shippers to inject and withdrawal gas based on the dynamic market conditions which are a result of the Gas Accord adopted in 1996. R16-4 cont'd

Environmental Consequences:

The RDEIR/EIS states that the flooding of the PG&E easement would not increase the risk of structural failure of the operating gas pipeline or cause a physical change in PG&E's ability to supply gas to the Bay Area or Sacramento/Stockton. This statement is totally unsubstantiated as this conclusion cannot be rationally drawn from the data which is presented within the RDEIR/EIS documentation. Those making this statement are obviously not experts in the field of pipeline design or maintenance and have failed to consider not only the challenging environment which the existing gas transmission pipelines operate in but also the fact that these facilities operate at extremely high pressure which can lead to a variety of failure modes for the pipeline, the initiation of which cannot easily be detected nor repaired in a submerged environment. R16-5

The various mitigation measures which are recommended by the RDEIR/EIS are generally inadequate to fully mitigate the concerns which PG&E has in regards to maintaining the pipeline integrity over the remaining life of the existing facilities. The most significant issue is "Potential Delay in Emergency Repairs and Unscheduled Interruption of Service". Under the "Delta Wetlands Project Conditions" the document indicates that pipelines very rarely fail without external forces or third-party activities. In general this statement is true, however the Delta Wetlands project will create unknown and undefined new external forces as a result of the levee stability work and the inundation of the interior of Bacon Island on a cyclical basis. This project is a significant third party activity which must be mitigated or rejected. There are two false statements which follow the statement regarding the safety of pipelines. 1) Internal inspection is required by State and Federal Regulators 2) It is common industry practice to allow small leaks to go unrepaired for months. First, PG&E has performed inspections on Line 57B based on the criticality of this facility to operations, not because of regulatory requirements. Second, although it is acceptable to allow a Grade 2 or Grade 3 leak to continue, any leak on Line 57B which operates at up to 2160 psig would not fall into one of these categories and would require immediate repair or shutdown by PG&E. R16-6

Given the uncertainties of the potential impacts to both gas transmission to and from the McDonald Island gas storage facility, and the specific needs to maintain the integrity of the lines that Delta Wetlands proposes to periodically flood, PG&E strongly recommends that the Draft EIR/EIS consider the environmental impacts of rerouting lines 57 A and 57 B away from Bacon Island. Rerouting around the impacted areas on Bacon Island is similar to the recent situation involving Contra

Costa Water District's Los Vaqueros Reservoir, where the District acknowledged the necessity and funded the relocation of PG&E gas and electric transmission lines away from inundated areas. R16-6 cont'd

Additional Issues Not Addressed by the RDEIR/EIS

Two significant issues are not addressed by the RDEIR/EIS which include the following:

PG&E will face significantly increased costs associated with the future expansion of pipeline capacity to increase usage of the McDonald Island Gas Storage Facility if the Delta Wetland's Project is constructed. Presently, PG&E has an open easement in which additional gas transmission facilities could be constructed using traditional construction methodology across Bacon Island. If the Delta Wetlands project is constructed then PG&E would either be required to bore the entire distance from McDonald Island to Palm Tract or would have to choose a much longer route between McDonald Island and Brentwood Terminal which did not include crossing Bacon Island. R16-7

The second issue is the replacement of Line 57A or Line 57B at the end of their design lives. Neither of these pipelines was designed to operate in a flooded condition and PG&E's ability to maintain these facilities will be impaired by the conditions which will be present on Bacon Island. The effect that the cyclical filling and dewatering of the island will have on the underlying soils may as-well-as the levee structures surrounding the island could more quickly degrade the critical bond between the pipeline coating system and the steel line which could lead to accelerated corrosion and a significantly decrease in the design life of these pipeline facilities. Internal and external surveys to determine the condition of the pipelines and their cathodic protection system are expensive to implement and are beyond the normal maintenance requirements which are mandated by code or required under present circumstances. R16-8

Pacific Gas and Electric Company

R16-1. Electrical distribution lines on the Delta Wetlands Project islands are discussed in Chapter 3E, "Utilities and Highways". See responses to Comments E15-1 and E15-2.

R16-2. The text in Chapter 7 of the 2000 REIR/EIS has been revised to reflect the commenter's corrections to the section entitled "Definition of Terms" (see Chapter 3E of Volume 1 of this FEIS). The following changes have been made:

On page 7-2 of the 2000 REIR/EIS (FEIS Volume 1, page 3E-24), the term "load center" has been removed from the list of definitions. The following change has been made under "Natural Gas Service" on page 7-3 of the 2000 REIR/EIS (see FEIS Volume 1, page 3E-25):

> The McDonald Island Storage Field is used primarily to supply gas to the Bay Area and Sacramento/Stockton ~~load~~ market centers . . .

The following change has been made on page 7-7 of the 2000 REIR/EIS (FEIS Volume 1, page 3E-28) under "Environmental Consequences":

> . . . PG&E's ability to supply gas to Bay Area or Sacramento/Stockton ~~load~~ market centers.

On page 7-2 (FEIS Volume 1, page 3E-24), the definition of "internal inspection" has been replaced with the following:

> *Internal Inspection*: The process of evaluating pipeline stresses from within the pipeline. A robotic device commonly called a "pig" is sent along the inside of the pipeline. The pig measures the shape of the pipeline, noting where the pipeline shape is abnormal (i.e., oval instead of round) and where the pipeline has ripples that indicate that the pipeline is bent or stressed.

On page 7-2 (FEIS Volume 1, page 3E-24), the definition of "pipeline balancing" has been replaced with the following:

> *Pipeline Balancing*: The process that gas utilities use to balance the customer loads (demands) with the available supplies of natural gas. Inflows to the system must be balanced on a continuous basis against outflows from the system.

R16-3. The preparers of the 2000 REIR/EIS tried to obtain additional data about pipeline safety records; however, the California Public Utilities Commission (CPUC) did not provide requested data on pipeline safety in the Delta region, and PG&E did not provide additional information. The U.S. Department of Transportation (DOT) pipeline safety data were not

used to make impact assessment conclusions; these data are provided to generally describe pipeline safety and the relative causes of pipeline incidents in the United States.

As described in the 2000 REIR/EIS, the risk of pipeline leaking or rupture is no greater under project conditions than under existing conditions. Two of the main risks to the pipeline are corrosion and physical damage from ground-disturbing equipment (e.g., farming and excavation). The pipelines are currently in cyclically dry and saturated soil as a result of farming operations and seasonal changes in groundwater levels. Therefore, implementation of the proposed project would not substantially alter the corrosive forces exerted on the pipeline. Changing the island from agricultural to flooded reservoir conditions would eliminate nearly all potential risk from ground-disturbing activities.

The need for the McDonald Island gas line repair described by the commenter was a result of levee settlement. The 2000 REIR/EIS recognizes that levee improvements on Bacon Island could result in a significant impact on the gas pipelines and recommends mitigation measures to account for that risk. The 2000 REIR/EIS also identifies the potential effects of project operations on routine inspection and maintenance procedures and identifies these impacts as significant. The 2000 REIR/EIS recommends several additional mitigation measures to ensure the continued safe operation of PG&E's Lines 57-A and 57-B where they cross Bacon Island. These measures require that Delta Wetlands:

- monitor levee settlement and subsidence where gas lines cross Delta Wetlands' levees,
- implement corrective measures to reduce the risk of construction-related pipeline failure,
- provide additional pipeline weighting if necessary,
- provide boat access for inspection activities, and
- relocate cathodic test facilities.

R16-4. The discussion that began on page 7-3 of the 2000 REIR/EIS (page 3E-25 of Chapter 3E of FEIS Volume 1) described the role of the McDonald Island storage facility and the change in its role since the Gas Accord was adopted in 1996. To clarify the current use of this facility, the following changes have been made to the text under "Natural Gas Service":

> The McDonald Island Storage Field ~~is~~ has been used primarily to supply gas to the Bay Area and Sacramento/Stockton market centers when other resources, such as gas production fields in Canada and the southwestern United States, are inadequate to meet instantaneous (i.e., peak) demands. . . .

> . . . Under the new Gas Accord, PG&E's role as a storer of natural gas ~~will increase~~ has increased; consequently, PG&E's use of the McDonald Island Storage Field and reliance on Line 57-B ~~will also increase~~ has also increased. The McDonald Island Storage facility is used year-round by various marketers and shippers to inject and withdraw gas based on dynamic market conditions resulting from adoption of the Gas Accord.

R16-5. See response to Comment R16-3 above. An environmental analysis considers changes between existing conditions and conditions with project implementation. The pipeline failure mechanisms for Lines 57-A and 57-B under with-project conditions would not differ substantially from those under existing conditions. Chapter 7 of the 2000 REIR/EIS described pipeline inspection procedures used by PG&E for pipelines in inundated conditions (see Chapter 3E of FEIS Volume 1).

The lead agencies acknowledge that PG&E continues to disagree with the conclusions of the impact analysis presented in Chapter 7 of the 2000 REIR/EIS (FEIS Volume 1, Chapter 3E). This comment and those that follow in PG&E's letter reflect the disagreement among experts that was also evidenced in testimony presented by PG&E's witnesses, other pipeline experts, and the preparers of the NEPA and CEQA analysis during the SWRCB's water right hearing for the Delta Wetlands Project. The 2000 REIR/EIS presents conclusions that are based on substantial evidence and expert opinion regarding the differences between the no-project and with-project condition. PG&E has presented no additional data to support the conclusion that its gas pipelines have been or would be significantly damaged by inundation. For example, PG&E has presented no evidence of damage to Line 57-B resulting from the flooding of Mildred Island, which occurred 17 years ago.

R16-6. The commenter states that "the project will create unknown and undefined new external forces [on the pipelines] as a result of levee stability work and the inundation of the interior of Bacon Island on a cyclical basis". The effect of levee strengthening on pipelines is known and addressed regularly by PG&E. The recent repair of Line 57-B on McDonald Island is an example of this situation. The 2000 REIR/EIS identifies the potential impact of levee strengthening on the pipelines as significant and recommends mitigation measures to address those effects.

Flooding Bacon Island would not result in new, undefined or unknown effects on the pipelines. As stated above and in the 2000 REIR/EIS, the pipelines currently cross channels and a flooded island (i.e., Mildred Island) in the vicinity of Bacon Island; on Bacon Island and other agricultural islands in the Delta, the pipelines experience cyclical dry and wet periods as a result of seasonal changes in groundwater elevations. Additionally, the load or weight of 30 feet of water on the pipeline would not increase the risk of pipeline failure.

The load imparted by 30 feet of water is equivalent to one atmosphere or approximately 14 pounds psi. When compared to the rated operating pressure of PG&E pipeline 57-B,

the pressure on the outside of the pipeline when the reservoir island is full would be approximately 1% of the internal pressure. Changes in loading caused by pressure fluctuations within the pipeline are much greater than changes attributable to external pressure from the filling and emptying of the reservoir island. The filling and emptying of the island could result in external pressures that vary from about 14 to 28 psi over several months; by contrast, internal pipeline pressure can vary by hundreds of psi over a few minutes' time, depending on whether the pipeline is being used to inject or withdraw gas from the McDonald Island storage facility and the desired rate of injection or withdrawal. Inundation of the line does not represent a new or substantial change in the condition of these pipelines.

Relocating the PG&E pipelines is not required as mitigation of the project and does not need to be evaluated in the environmental analysis for the Delta Wetlands Project. It should be noted that CCWD relocated the gas pipeline for the Los Vaqueros Project because the line was located underneath the proposed site of the dam; relocation was not required as mitigation of potential effects on the pipeline from inundation.

R16-7. The availability of PG&E's easement for future gas pipeline expansions is a private property rights issue. See response to Comment E15-4.

R16-8. As described in responses to Comments R16-3 and R16-6 above, implementation of the proposed project would not create new conditions that would lead to accelerated corrosion or decrease the design life of the pipeline facilities.

JUL 17 2000

12 July 2000
Wednesday morning

r.e.:Public Notice #190109804

Gentlemen,

I own property on Bethel Island. My wife and I plan to retire here in another 10 years. I've read this public notice and have some questions regarding the intentions of this project. For you information I'm 53 years old. Please bear with me. I'm getting older and crustier and this is the first time I've ever responded to a public notice.

I would like to clarify;" what are the intentions of the Delta Wetlands Properties?" They state that they plan to build two "reservoir islands" and seasonally divert water to two "habitat islands." Will this water be used "solely" for this purpose or do they plan to store this water and later sell it to S. Calif. in summer months when water is in high demand? How will this water be delivered to the two distant habitat islands? Will our Property Taxes be increased, or have a supplement on our tax roll to pay for these inprovements? Nothing is ever free!

R17-1

What is the purpose of the habitat island? To promote the well bieng of our natural wildlife or to increase the duck population so hunters have more ducks to blast. Rumors have it that the purpose of the "air strip" on Bouldin Island is to bring in duck hunting parties. I sincerely hope that this is not there intentions! My wife and I really enjoy the wildlife around our property; i.e., ducks, pheasants, quail, rabbits, eggrets, etc.

How much more of an impact on our water ways will new recreation facilities have? Many of our existing sloughs are building up with silt, weeds and other related problems. Many boaters now won"t even observe the"no wake zone - 5 m.p.h." within posted area's and the Delta Water Properties want to build more facilities.

I would appreciate any further information that is available to be sent to me. If you need money in advance, please call me and I'll send you a check.

Most sincerely,

Bob Raney

Bob Raney
12958 Elkwood St.
N. Hollywood, Calif. 91605
1-818-982-2946 Home 1-323-663-3209 Work weekdays

4514 Stone Rd.
Bethel Island, Calif. 94511

Bob Raney

R17-1. This comment letter was received in response to USACE's public notice regarding the availability of the 2000 REIR/EIS. Copies of the executive summaries for the 1995 DEIR/EIS and 2000 REIR/EIS were sent to the commenter at his request.

The purpose of the Delta Wetlands Project, as stated in the 1995 DEIR/EIS and the 2000 REIR/EIS, is "to divert surplus Delta inflows, transferred water, or banked water for later sale and/or release for Delta export or to meet water quality or flow requirements for the Bay-Delta estuary". The intent of the habitat islands is to compensate for impacts on, and promote the recovery of, state-listed threatened or endangered wildlife species and other special-status species, and to provide additional wetlands and wildlife habitat in the Delta.

The islands that would be converted to habitat use are currently used for agriculture. Delta Wetlands has existing appropriative and riparian rights to divert water to these islands; Delta Wetlands' proposal is to continue to divert water to the habitat islands under these rights and under new appropriative rights. Delta Wetlands would install screens on all existing and new siphons for the protection of fish species. Water used on the habitat islands would not be discharged for export.

The HMP for the habitat islands has been designed by DFG and Delta Wetlands to provide a variety of habitat types for state-listed species. It will provide valuable habitat for many other species of birds and wildlife as well. The provision of hunting areas and hunting opportunities is one component of the HMP; the HMP specifies various controls on hunting activity. See Appendix G3 of the 1995 DEIR/EIS for a full description of the elements of the HMP, including habitat types that would be created, species expected to use the islands, and hunting restrictions.

The effects of constructing new boating facilities on waterway traffic were evaluated in the 1995 DEIR/EIS and are discussed in Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

The project applicant is a private entity; no tax increases would be associated with the lead agencies' approval of the project.

RECLAMATION DISTRICT #830
P. O. Box 1105
Oakley, CA 94561-1105
(925) 625-2279
fax (925) 625-0169

July 24, 2000

State Water Resources Control Board
Division of Water Rights
Attention: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers
Regulatory Branch
Attention: Mike Finan
1324 J Street, Room 1480
Sacramento, CA 95814-2922

RE: Comments on Delta Wetlands Revised Draft EIR/S

Gentlemen:

Thank you for the opportunity to comment on the Delta Wetlands Revised Draft Environmental Impact Report/Statement (REIR/S) published May, 2000. As you noted at page 1-2 of the REIR/S:

> This REIR/EIS does not include formal responses to comments on the 1995 DEIR/EIS, although it does address several issues raised in those comments. Formal responses to all comments on the 1995 DEIR/EIS will be presented in the final environmental impact report/ environmental impact statement (FEIR/FEIS) on the Delta Wetlands Project along with responses to comments on this REIR/EIS. Comments submitted on the 1995 DEIR/EIS do not need to be resubmitted.

As you know, Reclamation District 830 (RD 830) submitted a letter dated December 21, 1995 commenting on the 1995 DEIR/EIS. After reviewing the REIR/S, RD 830 hereby R18-1

formally resubmits the comments it made in 1995, even though it is not necessary to do so. In particular, RD 830 finds that the "New Information on Erosion Effects of Boat Wake" at page 6-17 is not responsive to Comment 3 in its December 21, 1995 letter. **R18-1 cont'd**

In closing, thank you for the opportunity to comment on the Draft EIR/S. I am looking forward to your responses to RD 830's comments submitted in 1995, as well as to the above comment.

Very truly yours,

David N. Bauer

David N. Bauer, President
Board of Trustees

CAB\WP80
830\SUTTON.COM

Reclamation District #830

R18-1. See responses to Comment Letter C16; see also Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities".

Letter R19

RECEIVED
JUL 31 2000

BRADFORD RECLAMATION DISTRICT NO. 2059
504 Bank of Stockton Building
311 East Main Street
Stockton, CA 95202
(209) 943-5551

July 28, 2000

State Water Resources Control Board
Division of Water Rights
Attn: Jim Sutton
Post Office Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers, Sacramento District
Regulatory Branch
Attn: Mike Finan
1325 J Street, Room 1480
Sacramento, CA 95814-2922

Re: Delta Wetlands EIR/EIS
Levee Stability and Seepage Technical Report by
URS Griener Woodward Clyde (URSGWC)

Dear Mr. Sutton & Mr. Finan:

As President of the Board of Trustees of Bradford Reclamation District No. 2059 (District), I have reviewed the subject Appendix H of the Delta Wetlands EIR/EIS (herein referred to as the "Report") and submit the following comments on the District's behalf.

The District has reviewed the comments submitted on behalf of the Central Delta Water Agency, and with this letter joins in supporting those comments and has incorporated herein a portion of those comments in this letter.

Bradford Island is particularly concerned about this project, due to the direct impact that it will have on the District, its levees and the lands within the District. When Webb Tract flooded in 1980, Bradford Island experienced a large amount of seepage, both beneath its levee foundation as well as out in the middle of the Island. The question now is not whether seepage will occur, but rather how much more seepage will occur than what Bradford Island experienced in 1980. This concern is based upon Delta Wetlands' plan to raise the water surface on Webb Tract to an elevation of 6.0 feet, which is at least 5 feet higher than the water surface elevation was on Webb Tract, during the 1980 flood event and which resulted in significant seepage on Bradford Island. **R19-1**

The Report did not assess the most severe conditions that may be encountered on this project nor did it analyze the areas with the most challenging soil conditions. A levee system is **R19-2**

only as good as its weakest link. It is customary to evaluate the extremes and to design accordingly when looking at a flood control levee. The Report must address both extreme flood and seismic conditions and the areas with the most critical soil conditions and report the results accordingly. **R19-2 cont'd**

The Report states that interceptor wells generally appear to mitigate seepage problems provided they are properly designed and constructed and most of all properly maintained. The cost to operate and maintain these wells will be a high cost that must be taken into account when evaluating the potential success of this project. The District and the landowners on the Island do not want these interceptor wells on Bradford Island, do not want to be responsible for maintaining them and do not believe that they will prevent seepage on Bradford Island. **R19-3**

The Report suggests that if seepage should occur after Webb Tract has been flooded under the Delta Wetlands' project, that they will, in steps, reduce the water level on Webb Tract until the seepage stops. Once the seepage is present, the damage has been done. Lowering the water level on Webb Tract will not prevent the damage, although it may tend to lessen the damage. During the 1980 flood of Webb Tract, Bradford experienced subsidence in its levees, the effects of which can still be seen today. In addition, the seepage not only appeared in the fields in the middle of Bradford, but also increased the flow of the natural artisan wells on the island by two to three times the normal flows for those wells. **R19-4**

Delta Wetlands has still not addressed the issues and concerns of this District, and the landowners therein, as previously expressed. The Report does not provide any assurance or plan for preventing seepage from Webb Tract onto Bradford Island, and further provides no assurance or method of receiving compensation in the event that they suffer damages resulting from the flooding of Webb Tract; the District and the landowners should not be forced to commence litigation as a means establishing and recouping their damages, thus expending large amounts of money in legal fees and costs as a means of forcing reimbursement for those damages.

The proposed standards should be considered as preliminary and be subject to review and modification based on observed seepage conditions. The District believes that the baseline measurement period should be longer than one year, and certainly no less than three years. **R19-5**

The Report provides values for wave run-up and reservoir setup but does not provide the calculated wave height values. The District believes the wave heights should be calculated and the levee freeboard should be evaluated. **R19-6**

The District recommends performing additional sensitivity analyses for the seepage condition related to the location of the borrow pits. The borrow pit excavation will potentially remove horizontally bedded, lower hydraulic conductivity layers, and provide direct seepage paths into higher hydraulic conductivity horizontal layers. **R19-7**

The water surface elevations for the 100-year flood plain were not considered in the levee stability analysis. It is important that the analysis address the most critical case rather than only what is considered representatively critical. **R19-8**

In addition to analyzing the 100-year flood plain, the Report should analyze the additional stage that can occur over that of the 100-year flood plain, which results from wind waves generated over areas with a long fetch. Attached to this letter is an excerpt from a hydrology report prepared by the US Army Corps of Engineers in February of 1992, reporting the 50, 100 and 300-year flood elevations in the Delta. The purpose of the excerpt is to demonstrate that the stage frequency flood data presented in the USACOE's report are for static water conditions only, and they do not take into account wave action from wind and other sources. The attached stage data showing wind wave heights must be added to the 100-year flood plain elevation and then the levee stability analyzed accordingly. **R19-8 cont'd**

The sections chosen for stability analysis on Webb Tract are not the most critical. Webb Tract's levee station 160+00 is OK, whereas levee station 630+00 is not the most critical. Sections that should be included on Webb Tract include sections between levee station 475+00 to 525+00 and levee station 410+00 to 430+00. Soil conditions and historical performance support the need for analysis of conditions at these additional sections. **R19-9**

The Factors of Safety (FOS's) for the levee waterside slopes are not acceptable. The project needs to consider its options to reduce the driving forces causing the instability on the waterside by designing setbacks and/or benching the existing waterside slopes versus the proposed impracticable waterside buttressing and/or flattening of slopes. The range of FOS's calculated for the existing condition on the waterside slope of the levee appear to be about two-tenths higher than expected from that experienced in the Delta. A range of 1.3 to 1.5 is reported for the existing conditions on the waterside slope; the District thinks a range of 1.1 to 1.3 is more typical for the waterside slope. The District believes that these slightly higher FOS's result from the type of laboratory testing that was used to develop the total stress strength parameters. The Report should discuss the suitability of the testing methods for the soil layers used in the stability analysis model. **R19-10**

The Report should provide a more detailed description and discussion of the liquefaction evaluation. It is generally well known that the Delta area has extensive shallow deposits of potentially liquefiable Holocene sands, silty sands and sandy silts. The Report should clearly show the post earthquake configuration of the critical levee section and demonstrate that an effective levee section remains after the design earthquake. The Report currently estimates deformations in the range of 2-4 feet, but does not demonstrate where that deformation occurs. **R19-11**

Webb Tract is partly bordered by rivers that have geologically old alignments and locations, that is, by the San Joaquin River to the north and False River to the south. Extensive Holocene sand deposits are often found beneath and adjacent to these ancient river locations. The Report should address the potential effects of these sand deposits, together with the potential for earthquake induced lateral spreading.

The Report uses effective stress strength parameters for the peat and organic soils to calculate long-term levee stability. The District believes that the Report also use undrained strength analysis parameters for the peat and organic soils to calculate long term stability because the effective stress strength parameters may not account for pore pressure increases that occur during shearing which result in unconservatively higher FOS's. **R19-12**

The levee break analysis should be re-done to better show the progression of a levee break. Levee breaks typically start with a fairly narrow width, then eroding substantially into a much wider opening. At the narrower stages of a break, there is a much greater focus of erosive energy directed on the opposite levee. Observations of past levee breaks in the Delta area show that the hydraulic erosion extends over 1,000 feet landward, 600 to 1,000 feet wide, and develops scour holes down to the depths of the geologically older Pleistocene soils which may occur between depths of 40 to 80 feet deep. Riprap alone will not withstand the maximum flow rates expected from a levee failure from a full reservoir island. The Report must better address the mitigation measures to avoid the impacts of this extreme erosive force **R19-13**

Groundwater on Webb Tract varies 3-5 feet below the surface. The Report indicates that borrow operations are intended to go down 9 feet. The dewatering techniques necessary to borrow to that depth have not been addressed in this Report.

The Report is not clear as to whether the calculated quantities for borrow are based on the neat quantities required to fill between the lines and grades of the design and the finished section or whether it includes factors for shrinkage, settlement and subsidence. It must be anticipated, at a minimum, that the fill requirements for this job will be on the order of 60% to 200% +, in excess of calculated neat yardage to take into account shrinkage, settlement and subsidence. The District has been advised that the District's engineer has looked at one of the design sections and projected the neat fill requirements for Webb Tract based off that section. The nature of this gross estimation is recognized, nevertheless the results of that estimate was 4.0 million cubic yards, which confirms that the Report was based on neat yardage rather than the actual yardage required by taking into account the shrinkage, settlement and subsidence. If this gross estimate is correct, then the Report needs to re-evaluate its quantity requirements and take into account the required variance over the neat yardage calculation. **R19-14**

The Report states in the summary of slope stability analysis that the design is inadequate in meeting the criteria set forth by the USACOE and DSOD. The project must not be approved or allowed to move forward unless it is demonstrated that these design criteria can be met and a stable levee will be constructed. **R19-15**

It is interesting to note that the only example of reservoir storage in the Delta comes by way of the State of California, Department of Water Resources, State Water Project's Clifton Court Forebay. This example is interesting since the State of California, in its endeavor to maintain water in a historical reclamation district, chose not to rely on the existing reclamation district levees, but rather to construct new setback levees in accordance with DSOD's standards. It is also interesting to note that the new setback levees were no longer referred to as levees but rather they are referred to as dams. Several important facts to keep in mind when comparing the State's example of a reservoir levee (dams) to the levee being proposed by Delta Wetlands includes the facts that the State's dams were constructed on a solid sandy/clay foundation, they were constructed from the foundation up, and they are only designed to hold water at elevation 2.0', while the Delta Wetlands' levee is proposed to be constructed over historic foundation underlain by deep organics and is proposed to maintain water at elevation 6.0'. The technical and physical differences are significant and can not go unnoticed when considering the risk that it will be exposed to under the Delta Wetlands' proposal. **R19-16**

The recommended stage construction for the levees is to extend construction over a 4 to 6 year period. This Report should address the techniques and procedures, which will be employed to monitor and control the filling so as to not overstress and possibly fail the levees. R19-17

The fact that the Report has not addressed the most critical levee sections on the reservoir islands and the fact that the Federal and State FOS's required for this type of construction are not met requires that the project reconsider its design and resubmit for review. And most importantly from the District's standpoint, the Report fails to adequately address the seepage issue that will result to Bradford Island when water to a depth of 6.0 feet is stored within Webb Tract. It is critical that these issues be addressed to provide for the protection of the lands within Bradford Reclamation District No. 2059 before Delta Wetlands is given authority to proceed with its project.

This matter is of great concern to the landowners of Bradford Island. A substantial number of the fifty two landowners on Bradford Island have expressed concern over this matter and have expressed support for the position that the District has taken and is taking with respect to this matter. In addition, the following landowners, representing nearly half of the Island, have asked that their names be made a matter of public record in supporting the position of the District as expressed in this letter:

LIZA J. ALLEN
ROBERT C. and JEAN M. BENSON
BRENT and ELIZABETH GILBERT
E. E. and ESTHER MAE GILBERT
MARK GILBERT
EUGENE C. and ESTHER LEWIS
STOCKTON PORT DISTRICT

If you have any question regarding the enclosed comments please call me.

Sincerely,

BRADFORD RECLAMATION DISTRICT NO. 2059

By _____
Brent Gilbert, Chairman

BG/awh/phf
Encl.
Cc: See attached list

OFFICE REPORT

FEBRUARY 1992

SACRAMENTO-SAN JOAQUIN DELTA
CALIFORNIA

SPECIAL STUDY

HYDROLOGY

US Army Corps
of Engineers
Sacramento District

RECEIVED
MAR 24 1993

failures. The curves were smoothed to remove any localized effects of a levee failure.

3. The maximum elevation on a stage-frequency curve does not exceed the height of the levee crowns at that location. The curves are drawn solid up to the 100-year level. This reflects the reliability of the gaged data. Above the 100-year elevation, the stage-frequency curves are dashed. The curves are dashed above the 100-year level due to the many uncertainties that can occur at the higher frequencies. No stations have a period of record long enough to have actual data that would have a plotting position rarer than the 100-year event. Therefore, in order to estimate elevations of frequencies greater than the 100-year, the curves are extrapolated based on judgement and the shape of the curve below the 100-year. The height of the adjacent levee crown is also taken into account. The stage-frequency curves do not exceed the height of the adjacent levee crown.

C. Results - The 50- and 100-year higher-high stages at the 24 stations used in the analysis are shown in Table 6. In an attempt to determine the conditions that would cause a 100-year flood stage, or any other high flood stage, historical events were examined to establish the influence of wind, flood inflow, tidal cycle and barometric pressure on Delta stages. It was concluded that many combinations of these parameters could be possible, each with a varying degree of probability, and that predicting the factors which cause a particular high stage, or the effect of changes in one or more parameters, would be quite difficult.

When the stage-frequency data in this memorandum are used, it must be understood that:

1. For any particular frequency, the stage shown on the stage-frequency curve is valid only for that station. A stage created by any combination of high flows, tide, extreme barometric pressure, and winds could give a 100-year stage at one station and something of greater or lesser frequency at neighboring stations.

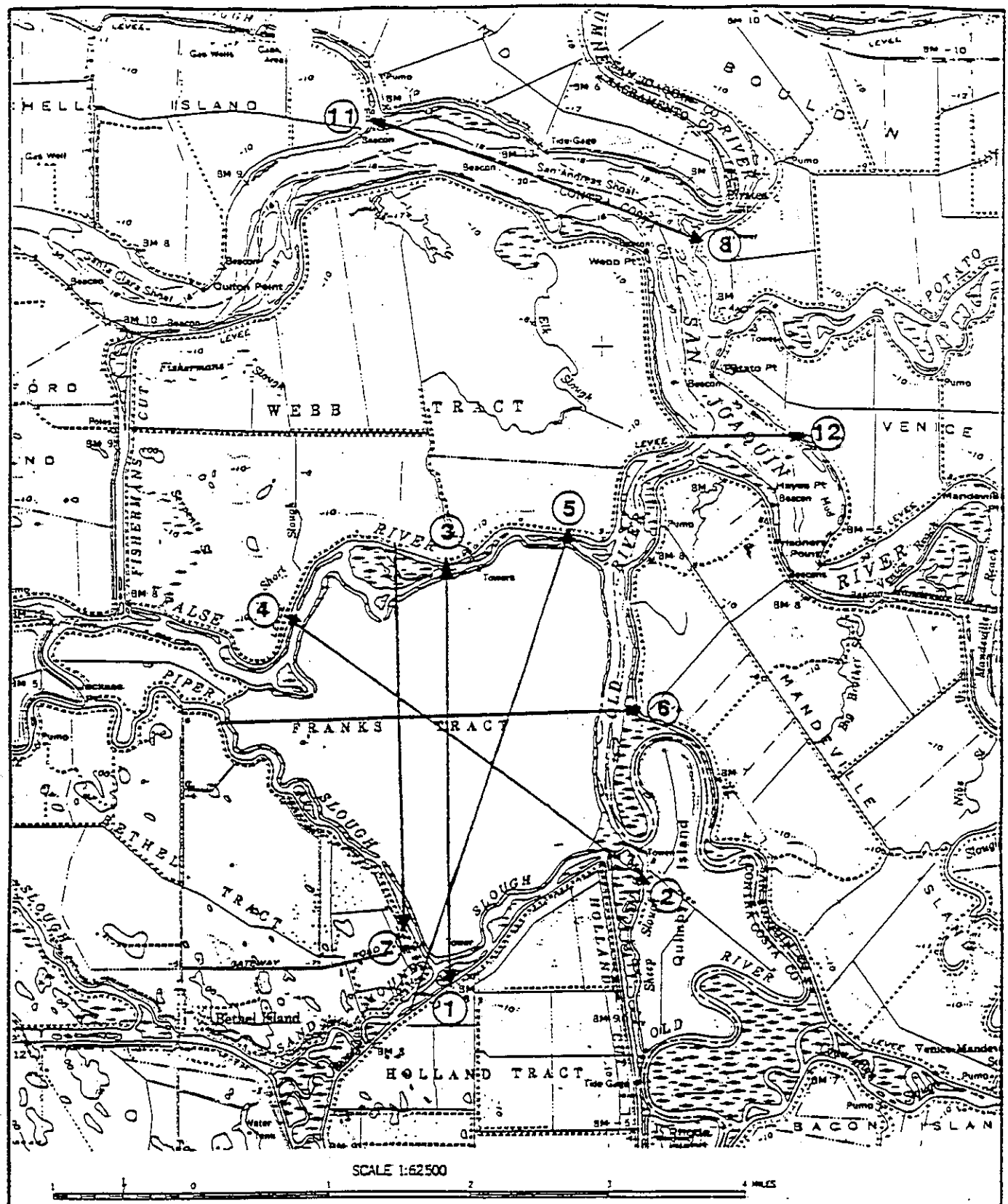
2. A maximum water-surface elevation plot developed for a particular frequency by straight-line connection of elevations from a series of stage-frequency curves will give an elevation higher, at some locations along the reach, than a historical event of corresponding frequency. This is due to the variation in width, depth and bottom slope of Delta channels. However, the error resulting from straight line elevations is less than 0.3 foot.

3. The stage data presented are for static water conditions. Wave action from wind, boats or other sources must be added to any stage data being analyzed. Wind set and any other hydrologic action that increases stages are reflected in the static stage data.

1. Sacramento River at Rio Vista - The stage recording gage for the Sacramento

TABLE 7
WIND-WAVE CALCULATIONS

Location	Levee Slope	Wind Direction	Design Windspeed (mph)	Wind Duration (min)	Design Wave (ft)	Wind Set (ft)	Wave Runup (ft)	Water Depth (ft)	Fetch Length (ft)
Holland Tract Location 1	1:2	North	35	45	2.5	.17	4.96	15	15,850
	1:3	North	35	45	2.5	.17	3.46	15	15,850
Quimby Tract Location 2	1:2	Northwest	29	51	2.1	.13	4.15	15	16,900
	1:3	Northwest	29	51	2.1	.13	2.89	15	16,900
Webb Tract Location 3	1:2	South	27	50	1.9	.10	3.70	15	15,850
	1:3	South	27	50	1.8	.10	2.56	15	15,850
Webb Tract Location 4	1:2	Southeast	35	47	2.3	.19	4.57	15	16,900
	1:3	Southeast	35	47	2.3	.19	3.30	15	16,900
Webb Tract Location 5	1:2	Southwest	23	60	1.7	.09	3.32	15	18,500
	1:3	Southwest	23	60	1.7	.09	2.30	15	18,500
Webb Tract Location 6	1:2	West	28	50	2.0	.11	3.89	15	16,150
	1:3	West	28	50	2.0	.11	2.70	15	16,150
Bethel Island Location 7	1:2	North	36	42	2.5	.17	4.90	15	14,600
	1:3	North	36	42	2.5	.17	3.41	15	14,600
Bouldin Island Location 8	1:2	Northwest	30	43	2.0	.11	3.84	15	13,500
	1:3	Northwest	30	43	2.0	.11	2.65	15	13,500
Sherman Island Location 9	1:2	Northwest	30	59	2.1	.17	4.20	15	21,350
	1:3	Northwest	30	59	2.1	.17	3.05	15	21,350
Jersey Island Location 10	1:2	West	27	76	2.1	.18	4.67	15	28,100
	1:3	West	27	76	2.1	.18	3.84	15	28,100
Twitchell Island Location 11	1:2	Southeast	36	39	2.4	.16	4.71	15	13,500
	1:3	Southeast	36	39	2.4	.16	3.26	15	13,500
Venice Island Location 12	1:2	West	29	22	1.2	.04	2.28	15	5,200
	1:3	West	29	22	1.2	.04	1.50	15	5,200



SACRAMENTO - SAN JOAQUIN DELTA

WAVE RUNUP LOCATIONS AND FETCH DIAGRAM

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: J.H.
Drawn: J.H.
Date: February 1992

SHEET 1 OF 2 CHART 26

Bradford Reclamation District No. 2059

R19-1. Appendix H, "Levee Stability and Seepage Technical Report", of the 2000 REIR/EIS presents a new analysis of the potential seepage impacts of Delta Wetlands reservoir operations and an evaluation of the effectiveness of the proposed seepage control measures.

Many of the comments in this letter duplicate comments received from the Central Delta Water Agency on the 2000 REIR/EIS (Comment Letter R6) and comments received from Bradford Reclamation District No. 2059 on the 1995 DEIR/EIS (Comment Letter C7). Where appropriate, the commenter is referred to responses to identical comments.

R19-2. This comment duplicates Comment R6-5; see Master Response 8, "Levee Stability Analysis and Worst-Case Conditions".

R19-3. See response to Comment R6-6 regarding the costs associated with operation of the interceptor well system and response to Comment C7-6 regarding the installation of monitoring wells on neighboring islands.

R19-4. The seepage monitoring program would be used to monitor groundwater conditions and would trigger a response from Delta Wetlands before seepage causes damage to neighboring islands. See response to Comment E14-10 regarding the actions that Delta Wetlands would use to control seepage before seepage reaches the diversion suspension limits (i.e., before the seepage performance standards are exceeded).

The commenter has observed that seepage may extend through deeper aquifer formations or may find a path of least resistance to a neighboring island some distance from the levees directly across from the reservoir island; this issue is discussed in response to Comment C7-5.

The commenter requests that the lead agencies require a compensation method in the event of damages. The physical environmental effects of the proposed project have been addressed in the NEPA and CEQA analysis, and adequate mitigation has been identified for those impacts. A requirement for compensation or a dispute resolution process does not directly address the physical effects of the project and is not required as mitigation for project effects. See response to Comment C7-8 regarding a dispute resolution procedure that has been included in the protest dismissal agreement between Delta Wetlands and EBMUD.

R19-5. This comment duplicates Comment R6-7; see response to Comment R6-7.

R19-6. This comment duplicates Comment R6-8; see response to Comment R6-8.

R19-7. This comment duplicates Comment R6-9; see response to Comment R6-9.

R19-8. This comment duplicates Comment R6-10; see response to Comment R6-10.

R19-9. This comment duplicates Comment R6-11; see response to Comment R6-11.

R19-10. This comment duplicates Comment R6-12; see response to Comment R6-12.

R19-11. This comment duplicates Comment R6-13; see response to Comment R6-13.

R19-12. This comment duplicates Comment R6-14; see response to Comment R6-14.

R19-13. This comment duplicates Comment R6-15; see response to Comment R6-15.

R19-14. This comment duplicates Comment R6-16; see response to Comment R6-16.

R19-15. This comment duplicates Comment R6-17; see response to Comment R6-17.

R19-16. The lead agencies have noted the information about Clifton Court Forebay provided by the commenter.

DSOD would need to approve the design for all Delta Wetlands levees used to store water to an elevation greater than 4 feet above sea level. See response to Comment B7-6 for more information.

R19-17. This comment duplicates Comment R6-18; see response to Comment R6-18.

State Water Contractors

455 Capitol Mall, Suite 220 • Sacramento, CA 95814-4409
John C. Coburn General Manager (916) 447-7357 • FAX 447-2734

Letter R20

Directors

***Thomas E. Levy**, President*
Coachella Valley Water District
***David B. Okita**, Vice President*
Solano County Water Agency
***Dan A. Masnada**, Secretary-Treasurer*
Central Coast Water Authority
Thomas N. Clark
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Tulare Lake Basin Water Storage District
Robert C. Sagehorn
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Santa Clara Valley Water District

July 31, 2000

Mr. Jim Sutton
State Water Resources Control Board
Division of Water Rights
P. O. Box 2000
Sacramento, CA 95812-2000

Mr. Mike Finan
U.S. Army Corps of Engineers
Regulatory Branch
1325 J Street, 14th Floor
Sacramento, CA 95814-2922

Re: State Water Contractors Comments on Revised Draft EIS/EIR for the Delta Wetlands Project

Dear Messrs. Sutton and Finan:

The State Water Contractors ("State Contractors") have received and reviewed the Revised Draft Environmental Impact Statement/Environmental Impact Report ("REIS/EIR") for the Delta Wetlands Project ("Delta Wetlands"). This letter represents the response of the State Contractors, affected stakeholders of Delta Wetlands, as required by the National Environmental Policy Act and the California Environmental Quality Act.

The State Contractors organization consists of 27 public agencies that hold contracts or rights for water delivered by the State Water Project ("SWP").[1] Member agencies of the State Contractors supply SWP water for drinking, commercial, industrial and agricultural purposes to nearly 22 million people (approximately two-thirds of California's population) residing in Northern California, the San Francisco Bay Area, the Central Valley, the Central Coast and Southern California.

[1]The public agencies that comprise the State Contractors are the following: Alameda County Flood Control and Water Conservation District, Zone 7, Alameda County Water District, Antelope Valley-East Kern Water Agency, Casitas Municipal Water District, Castaic Lake Water Agency, Central Coast Water Authority, City of Yuba City, Coachella Valley Water District, County of Kings, Crestline-Lake Arrowhead Water Agency, Desert Water Agency, Dudley Ridge Water District, Empire-West Side Irrigation District, Kern County Water Agency, Littlerock Creek Irrigation District, Metropolitan Water District of Southern California, Mojave Water Agency, Napa County Flood Control and Water Conservation District, Oak Flat Water District, Palmdale Water District, San Bernardino Valley Municipal Water District, San Gabriel Valley Municipal Water District, San Gorgonio Pass Water Agency, San Luis Obispo County Flood Control and Water Conservation District, Santa Clara Valley Water District, Solano County Water Agency, and Tulare Lake Basin Water Storage District

The State Contractors are very interested in matters affecting conditions in the Sacramento-San Joaquin Delta ("Delta"). The participation of State Contractor members in the CALFED process is an indication of this commitment. In these efforts, the State Contractors have been working closely on several key issues with the State Department of Water Resources ("DWR") and the California Urban Water Agencies ("CUWA"). The State Contractors have discussed the concerns about the REIS/EIR raised by both of these groups, and support the findings contained in their comment letters. R20-1

The State Contractors are supportive of planning efforts, which are designed to meet the increasing water needs of California in an environmentally sound manner. Delta Wetlands clearly attempts to achieve such a balance between beneficial uses of water. After review of the REIS/EIR, however, the State Contractors have concerns that the proposed Delta Wetlands Project could adversely affect the quality of the SWP supply it receives from the Delta, could adversely affect Delta fisheries, could result in increased Delta flood risk, and could adversely affect other Delta water users. The State Contractors concerns are summarized below:

Water Operations. Since the 1995 draft EIS/EIR, Delta Wetlands has developed Final Operations Criteria defining how the project actually would be operated and has also developed a stipulated agreement with the Department of Water Resources. With the analyses presented in the REIR/EIS that are based on the Final Operation Criteria and the stipulated agreement, the State Contractors concerns about water supply impacts on the SWP appear to have been addressed. Concerns remain, however, that Delta Wetlands operations may affect water level stages in the South Delta. In addition to the direct impacts reduced stages could have on in-Delta water users, such reduced stages could also result in indirect impacts to SWP operations. R20-2

Levee Stability. The REIS/EIR dismisses the potential for liquefaction of Delta Wetlands levees as a result of seismic activity. This is not consistent with the Corps of Engineers 1987 study, "Sacramento-San Joaquin Delta Levees Liquefaction Potential" or DWR geological investigations of Webb Tract and Bacon Island. The final EIS/EIR should address these and other levee stability issues. R20-3

Fisheries. Although the REIS/EIR indicates that Delta Wetlands fish screens would comply with fishery agency requirements, the specific elements of this compliance are not indicated in the description. For example, the REIS/EIR does not discuss issues of predation, hydraulic control, debris, cleaning systems or other maintenance. Additionally, the REIS/EIR does not address related issues of algal blooms and fisheries predation from Delta Wetlands facilities such as boat docks. R20-4

Water Quality. The REIS/EIR includes a considerable amount of additional water quality information and analysis that has been added since the 1995 DEIS/EIR. However, although the additional analysis does a better job of estimating potential water quality impacts, considerable uncertainty remains about the potential impacts on Delta water quality, especially salinity and total organic carbons. Additionally, the State Contractors remain concerned about how Delta Wetlands has defined significance criteria for water quality parameters. R20-5

The State Contractors concerns, and those of DWR and CUWA, should be fully addressed in the final EIR/EIS, and the impacts that have been identified need to be avoided or mitigated to a level of insignificance. The State Contractors acknowledge the efforts of Delta Wetlands in defining final operating conditions and developing stipulated agreements with DWR and other agencies to avoid water supply impacts. We are hopeful that ongoing efforts to develop similar agreements to address our water quality concerns can be successfully concluded.

In addition to the environmental issues identified above, the State Contractors continue to be concerned that Delta Wetlands wants to dramatically change Delta conditions even though it has not identified a single specific beneficial user of the waters it proposes to develop. The applicant has only been able to conceptually identify beneficial uses for the water, and states that it anticipates selling all or a portion of the project, or the water supplies developed by the project, to DWR, the U.S. Bureau of Reclamation (USBR), the State Contractors, or other entities within the SWP and CVP service areas. However, neither the DWR, nor the State Contractors, nor any other entity to our knowledge, has yet to confirm a meaningful interest in acquiring the project or contracting for the water. **R20-6**

Also, on the minds of the State Contractors is how this project might fit in with the Bay-Delta facilities and regulatory components now being developed through the CALFED Bay-Delta Program. In recent months, several different approaches to using Delta Wetlands for fisheries benefits have been identified in CALFED gaming efforts in addition to more traditional water supply purposes. However, until information about the proposed project operations to meet specific purposes is developed, it is not possible to determine whether the proposed project can be a feasible and beneficial element of the CALFED Bay-Delta Program, or any other program that may be implemented to resolve Bay-Delta issues, or be incompatible with such programs. **R20-7**

If you have any questions about our comments, please call Terry Erlewine at (916) 447-7357.

Sincerely,

John C. Coburn
General Manager

C: Thomas Hannigan, Director, DWR
SWC Member Agencies

State Water Contractors

R20-1. See responses to Comment Letter R2 from DWR and Comment Letter R4 from CUWA.

R20-2. Delta Wetlands Project operations would not affect stage in south Delta channels. This issue is discussed in Appendix B1 of the 1995 DEIR/EIS. Delta Wetlands diversions would occur during relatively high flow conditions when the effects of the siphon diversions on tidal stages in the south Delta channels would be relatively small. Delta Wetlands discharges would increase the stage slightly in the vicinity of the discharge pumps, but they are most likely to occur during the summer months when south Delta barriers or tidal gates would be operating to control south-Delta stage problems. Additional diversions into Clifton Court would be needed to allow the export of water from Delta Wetlands discharges; these diversions into Clifton Court would occur during relatively high tide stages (i.e., when water can flow over the Clifton Court intake weir). These diversions would not reduce tidal stages in the south Delta channels and would be within the normal Clifton Court operating conditions for diversion flows. Lastly, Delta Wetlands operations would need to be coordinated with the CALFED Ops Group; see response to Comment B6-49.

R20-3. See response to Comment R2-25 regarding liquefaction potential and the levee stability analysis.

R20-4. See response to Comment B7-64 for a discussion of the potential for predation at Delta Wetlands facilities. See response to Comment B6-60 regarding details of fish screen design that were developed through consultation with DFG, NMFS, and USFWS. See response to B7-50 regarding mitigation for algal blooms.

R20-5. See Master Response 6, "Significance Criteria Used for the Water Quality Impact Analysis", for a discussion of the significance criteria used in the 1995 DEIR/EIS and the 2000 REIR/EIS. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", and response to Comment R2-3 regarding project effects on DOC and THMs, mitigation, and the Delta Wetlands Project WQMP. See responses to Comments C9-17 and C9-22 regarding project effects on salinity, mitigation, and the WQMP.

R20-6. The 1995 DEIR/EIS states that the identity of the end user of the Delta Wetlands water remains speculative because of the diverse interests and competing demands for water for municipal, agricultural, and environmental needs. This issue was identified as an area of known controversy in the 1995 DEIR/EIS and the 2000 REIR/EIS. See Master Response 3, "Areas of End Use and Potential Growth-Inducement Effects of Delta Wetlands Water Deliveries", for more information about beneficial use of Delta Wetlands water.

R20-7. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

McDONOUGH, HOLLAND & ALLEN
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MARTIN McDONOUGH
(1915-1987)

July 31, 2000

State Water Resources Control Board
Division of Water Rights
Attn: Jim Sutton
P.O. Box 2000
Sacramento, CA 95812-2000

U.S. Army Corps of Engineers, Sacramento District
Regulatory Branch
Attn: Mike Finan
1325 J Street, Room 1480
Sacramento, CA 95814-2922

Re: Revised Draft Environmental Impact Report/Environmental Impact Statement for the Delta Wetlands Project

Dear Mr. Sutton and Mr. Finan:

This firm represents the City of Stockton. The City has the following comment/question regarding the RDEIR/EIS for the Delta Wetlands Project.

The hearing notice for the resumption of public hearing for the Delta Wetlands Project includes in the first hearing issue the question of how much unappropriated water is available to the Delta Wetlands Project in light of various constraints, including the settlement agreements between Applicant and some of the protestants. The RDEIR/EIS, at page 3-16 states that Agreements with the City of Stockton and Amador County include narrative requirements that prevent Delta Wetlands operations from directly or indirectly depriving inhabitants of those jurisdictions of any water reasonably required for beneficial uses. (The actual Agreement between Delta Wetlands Properties and the City of Stockton is Delta Wetlands Exhibit 32 and Stockton Exhibit 11 in the SWRCB hearings. It provides that the Delta Wetlands permit or license "shall be junior in priority to any application filed by the City of Stockton to obtain the water reasonably required to adequately supply the beneficial needs of the Stockton Urban Area or any of the

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inhabitants or property owners therein.") Later on page 3-16, the RDEIR/EIS states that Delta SOS simulates the various agreements reached by Delta Wetlands "by allowing maximum possible CVP and SWP export pumping and fully satisfying in-Delta diversions by agricultural and senior appropriative water right users." (Emphasis added.)

Did the Delta SOS simulation or the RDEIR/EIS take into account future appropriations by the City of Stockton which, by the settlement term, would be senior to the Delta Wetlands permit or license? For example, Stockton has filed Water Rights Application 30531 for diversions from the Delta. Did the Delta SOS simulation take this application into account? If not, the model simulation may provide misleading results with respect to the amount of water available to Delta Wetlands in future years, given the senior priority of Stockton's application. **R21-1**

Thank you for the opportunity to comment on the RDEIR/EIS.

Very truly yours,

Virginia A. Cahill

VAC:dg

cc: Morris Allen, City of Stockton
Delta Wetlands Service List

City of Stockton (McDonough, Holland & Allen)

R21-1. Delta Wetlands has signed an agreement with the City of Stockton to allow Stockton's water rights, including those filed under application 30531, to be considered senior to the Delta Wetlands water rights. The DeltaSOS modeling considered the City of Stockton future diversion to be part of the Delta diversions that are always fully satisfied in the modeling before any surplus water is allowed to be diverted onto the Delta Wetlands islands.

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
600 Harrison Street, Suite 515
San Francisco, California 94107-1376

August 17, 2000

Lieutenant Colonel Michael J. Walsh
U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, CA 95814
Attn: Mike Finan, Regulatory Branch

California State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000
Attn: Jim Sutton

Dear Lieutenant Col. Walsh and Mr. Sutton:

The Department of the Interior has reviewed the Draft Environmental Impact Report and Environmental Impact Statement (EIR/EIS) for the Delta Wetlands Project, Contra Costa and San Joaquin Counties, CA, and has no comments to offer. **R22-1**

Thank you for the opportunity to review this document.

Sincerely,

Patricia Sanderson Port
Regional Environmental Officer

cc:
Director, OEPC, w/original incoming
Regional Director, FWS, Portland

U.S. Department of the Interior

R22-1. The lead agencies acknowledge this letter.

RECEIVED
AUG 10 2000

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

AUG 8 2000

U.S. Army Corps of Engineers, Sacramento District
Attn: Mr. Mike Finan
1325 J Street, Room 1480
Sacramento, CA 95814-2922

Dear Mr. Finan:

The Environmental Protection Agency (EPA) has reviewed the U.S. Army Corps of Engineers' Revised Draft Environmental Impact Report/ Environmental Impact Statement (RDEIR/S) for the **Delta Wetlands Project, Contra Costa and San Joaquin Counties, CA.** Our review is pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act (CAA). The CEQ number assigned to this document is 000186.

Delta Wetlands proposes a water storage and habitat enhancement project on four islands in the Sacramento-San Joaquin River Delta (Delta). Water would be diverted and stored on Bacon Island and the Webb Tract for later discharge for export (e.g., to southern CA municipalities) or to meet outflow or environmental requirements. Water would also be diverted seasonally to create and enhance wetlands and to manage wildlife habitat on Bouldin Island and most of the Holland Tract. In addition, the project includes recreational facilities for boating and hunting along the perimeter levees on all four islands. Levees on all four islands would be strengthened and additional siphons and water pumps would be installed on the perimeters of the reservoir islands.

Four alternatives were analyzed in the 1995 Draft EIR/EIS. These were a No-Project alternative consisting of intensified agricultural use of the four islands; alternatives 1 and 2, consisting of water storage on two islands and implementation of an habitat management plan on the other two, and a higher level of discharge pumping with Alternative 2; and, alternative 3 consisting of water storage on all four islands with limited wetland habitat provided on Bouldin Island. Generally, the RDEIR/S evaluates the proposed project as represented by alternative 2.

Our comments are focused on the additional information covered in the RDEIR/S and, as such, have not considered the full range of issues associated with this proposed project. We recognize that the current proposal is analyzed from the perspective of use of Delta Wetlands appropriative water rights to meet export water supply demands. On the other hand, as the RDEIR/S recognizes, in the future the project might be adapted to other purposes, such as incorporation into CALFED plans for water management and habitat restoration. If, in the future, there are proposed changes in management and operation of the project– for example, changes R23-1

associated with CALFED acquisition– we would expect a thorough and comprehensive reexamination of project impacts and benefits. **R23-1 cont'd**

Based on our review and the environmental commitments outlined in the RDEIR/S, we have assigned a rating of **EC-2 (Environmental Concerns-Insufficient Information).** See the enclosed "Summary of EPA Rating System" for a more detailed definition of the ratings. Our concerns are based on the following: 1) the project, as proposed, may cause substantial degradation of Delta water with respect to its beneficial use as a source for drinking water. Among other effects, this degradation could limit the ability of drinking water providers to produce safe drinking water with respect to trihalomethanes, haloacetic acids and microbial pathogens; 2) the project, as proposed, may yield water with total organic carbon levels generally in excess of that specified as the target (3.0 mg/L) for CALFED as denoted in the Final EIS/R; and, 3) the RDEIR/S does not address the likely substantial impacts of recreational activities on microbial pathogen loadings, which will be key parameters for drinking water safety and compliance with upcoming drinking water standards. **R23-2**

We appreciate the opportunity to review this RDEIR/S. Please send two copies of the final EIS (FEIS) to the address above. If you have any questions, please contact Bruce Macler at (415) 744-1884 or Carolyn Yale at (415) 744-2016.

Sincerely,

David J. Farrel, Chief
Federal Activities Office

Enclosure

cc:	Carolyn Yale	WTR-3
	Bruce Macler	WTR-6

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Detailed Comments

Dissolved Organic Carbon Impact Significance Criteria

The RDEIR/S cites impact significance criteria of 90% of numerical water quality criteria and 20% above mean values for variables without numerical limits. Dissolved organic carbon (DOC) is not considered in this document to have a numerical water quality criterion. The RDEIR/S proposes a 20% significance criteria using the average or mean value of 4 mg/L, allowing a 20% increase before a significant impact occurs. This is an inappropriate criterion. Use of this criterion would allow an average increase in the delta export values of 0.8 mg/L of DOC. The RDEIR/S notes that total Delta lowlands (including Bacon and Webb) contribute 40% of export carbon at the southern export facilities. Using the 4 mg/L average, Delta lowlands contribute 1.6 mg/l of the 4 mg/L average concentration. Therefore, Delta Wetlands are suggesting that their increased contributions can equal an increase of 50% of all In-Delta drainage contributions at the pumps before the impact is significant. EPA believes this to be unacceptable. Because of this unacceptable contribution using this criterion, we believe that a more stringent criterion in appropriate.

The CALFED water quality program has set a target of 3 mg/L for total organic carbon (TOC). Given the project's proposed purpose of providing export water for southern California, analysis of Municipal Water Quality Investigations (MWQI) data at Banks shows the current probability of exceeding this standard for DOC is 68% (Bruce Agee May 2000- MWQI Delta Workshop). An additional 0.8 mg/L will further reduce the ability to meet this goal. A superior criterion exists that should be considered for this role, which would significantly alter the calculations and projected impacts. TOC, which is approximately the sum of DOC and insoluble organic carbon, will almost always quantitatively exceed DOC. We believe that the final EIS (FEIS) should use the 3.0 mg/L criterion. **R23-3**

Alternatively, the Interim Enhanced Surface Water Treatment Rule, promulgated by USEPA in 1998, includes an action level of 2.0 mg/L TOC that would trigger treatment requirements for enhanced coagulation. While use of this level would be desirable from a public health standpoint, it is substantially below average Delta TOC levels.

Drinking Water Quality

Negative Impacts of Ecosystem Restoration Projects

The data and calculations presented in the RDEIR/S indicate substantial degradation of water quality with respect to DOC levels, even using the Delta Wetlands DOC criterion. Use of the CALFED 3.0 mg/L TOC target as the criterion makes for an even greater discrepancy between project impacts and plausible water quality goals.

Negative Impacts from Recreational Activities

The RDEIR/S does not address the likely adverse impacts on water quality from anticipated recreational uses resulting from this project. These are of two types, both resulting **R23-4**

from fecal contamination.

First and foremost is the increased direct health risk to the recreators themselves from exposure to human microbial pathogens during body-contact recreation. Substantial data exist on the behaviors that lead to this contamination and on the resultant risks. The descriptions of recreational activities and the large number of recreational sites involved in this project indicate the potential for significant contamination to occur. This needs to be evaluated and addressed. Second, the increased microbial contamination expected from these activities pose health risks for those ultimately drinking this water. We would like to see a detailed analysis of the possible levels and loads of pathogen contamination resulting from recreational activities and an analysis of resulting health risks to the recreators and those drinking this water. **R23-4 cont'd**

Cumulative Adverse Impacts of Other Projects

No discussion is presented in the RDEIR/S of cumulative impacts from all sources, including other restoration projects, the Sacramento Regional Treatment Plant 2020 Master Plan, the Tracy Hills Wastewater Project, and the City of Tracy Wastewater Expansion Plans. These should be included in the cumulative impact assessment for the RDEIR/S under NEPA and CEQA. All of these projects have the potential to incrementally increase organic carbon at the export facility, along with the Delta Wetlands project. Since the State Water Resources Control Board can review and examine a broader range of issues when issuing water rights permits, cumulative impacts should be considered in the FEIS. **R23-5**

We are concerned that Delta Wetlands might provide a maximum of 3 to 4% of the total water exported through pumps from the Delta, yet the RDEIR/S states that the project can provide up to 20% of the carbon loading without this being a significant impact. We believe that this should be considered a significant impact in the FEIS. **R23-6**

SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

ADEQUACY OF THE IMPACT STATEMENT

Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

U.S. Environmental Protection Agency, Region IX (Federal Activities Office)

R23-1. For purposes of the NEPA and CEQA analysis, the Delta Wetlands Project is analyzed as a stand-alone water storage facility, operated independently of the SWP and the CVP, and without regard to potential integration with the CALFED Bay-Delta Program. See Master Response 2, "Integration of the Delta Wetlands Project with Federal and State Water Project Operations, including the CALFED Bay-Delta Program".

R23-2. The SWRCB and USACE acknowledge the commenter's evaluation of the 2000 REIR/EIS. See responses to Comments R23-3 through R23-6 for responses to specific concerns expressed in this letter.

R23-3. See response to Comment R2-3 regarding the significance criteria for DOC and estimates of DOC loading from Delta lowlands. See response to Comment R2-4 regarding the CALFED long-term targets for TOC. See Master Response 7, "Analysis of Effects of the Delta Wetlands Project on Disinfection Byproducts", regarding potential future drinking water quality standards.

R23-4. The commenter is concerned that the health risk resulting from direct exposure to fecal coliform (microbial) contamination would increase as a result of the private recreational uses of the Delta Wetlands islands, described in Appendix 2 of the 1995 DEIR/EIS and Chapter 3J of FEIS Volume 1. Although Delta Wetlands has removed construction of the recreation facilities from its CWA permit application, Delta Wetlands may subsequently apply for permits for all or some of the facilities. Health risks associated with recreational use on the project islands are discussed below.

The level of fecal contamination in water varies considerably depending on water circulation patterns, tide, wind, and rainfall (U.S. Environmental Protection Agency 1983). Although fecal contamination is an issue in the Delta, the majority of outbreaks related to body-contact recreation have occurred in closed, warm bodies of water with very low circulation (California Department of Health Services 1997).

Recreation activities can increase pathogen loading to a water body. Although coliform bacteria are not known to directly cause illnesses, they are used as a predictor of other disease-causing agents because monitoring for indicator bacteria is less expensive and easier than monitoring for pathogenic bacteria (U.S. Environmental Protection Agency 1998, U. S. Geological Survey 2000). Studies have found high levels of coliform bacteria in areas with heavy concentrations of recreational boats; these studies also indicate a direct relationship between the number of boats in a sampled area and increased coliform levels in both the water column and shellfish (San Francisco Estuary Project 1995).

Recreation activities can also increase the exposure of people to contaminants. Studies of swimmers, scuba divers, and windsurfers have shown measurable health effects associated with exposure to waters polluted by sewage (San Francisco Estuary Project 1995). In the

Delta, swimmers, waterskiers and others who swallow or come in contact with water that has been contaminated by human wastes can become ill.

The Delta Wetlands Project has the potential to affect water quality through recreational activities. The Delta Protection Commission reports that a lack of adequate restroom facilities is a continuing frustration for recreationists in the Delta (Delta Protection Commission 1997). The Delta Wetlands recreation facilities would each be equipped with restrooms for use by individuals using those facilities. Sewage disposal at the recreation facilities would comply with the requirements of the Central Valley Regional Water Quality Control Board (CVRWQCB) and local jurisdictions (see response to Comment A3-3). Boat pumpout facilities (for sewage transfer) are not included in the proposed design of the boat docks; however, the projected demand for these facilities as a result of implementing the project is low, and pumpout facilities are available in the vicinity of the project islands and at other locations throughout the Delta (see response to Comment B5-9).

The 1995 DEIR/EIS noted that the potential increase in pollutant loading from the project facilities and boating activities, in combination with other boating facilities in the Delta, could result in periodic pollution problems in Delta waters. Potential increased loading of pollutants in Delta channels therefore was identified as a significant cumulative impact. The mitigation recommended in the 1995 DEIR/EIS (Mitigation Measure C-9) requires the following:

Delta Wetlands shall post notices at all recreation facilities describing proper methods of disposing of waste.

Waste discharge requirements shall be posted and enforced in accordance with local and state laws and ordinances.

Delta Wetlands shall provide waste collection receptacles on and around the boat docks.

Delta Wetlands shall provide educational materials to recreationists that describe the deleterious effects of illegal waste discharges and identify the location of waste disposal facilities throughout the Delta. For example, educational materials distributed by Delta Wetlands could include boater education materials, pumpout maps, and pollution prevention guides developed by the San Francisco Estuary Project and the San Francisco RWQCB.

In response to concerns regarding the potential environmental effects of the proposed recreation facilities, the following mitigation measure also has been recommended:

Mitigation Measure: Reduce the Number of Outward Boat Slips Located at the Proposed Recreation Facilities. Delta Wetlands shall reduce the total number of outward (channel-side) boat slips proposed on the Delta Wetlands islands by 50%.

This mitigation is described in Master Response 5, "Mitigation of Environmental Effects Related to Use of Recreation Facilities". Implementation of this mitigation measure would reduce the amount of recreational activities supported by the project, thereby reducing the potential for recreation-related water quality impacts. Because the Delta Wetlands Project would still increase private recreation opportunities, it could increase the number of people susceptible to pathogens during body-contact recreation in the Delta. However, as described above, the Delta Wetlands Project would not substantially increase pathogen loading in the Delta; therefore, the health risk to individual Delta recreationists under the proposed project would not be different from the current risk to recreationists. In conclusion, additional risk to the public created by the addition of these recreation facilities is considered unlikely and further analysis is not warranted for the purpose of complying with CEQA and NEPA.

R23-5. See response to Comment R2-6.

R23-6. See response to Comment R2-7.

Chapter 5. Citations for the Responses to Comments

Chapter 5. Citations for the Responses to Comments

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WATER RIGHT HEARING TESTIMONY

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Appendix to the Responses to Comments

Appendix to the Responses to Comments

This appendix contains the following information:

- The National Marine Fisheries Service's adoption of the final conference opinion as its biological opinion for the threatened Central Valley steelhead;

- The National Marine Fisheries Service's Final Biological Opinion Concerning the Effects of the Proposed Construction of the Delta Wetlands Project on the Threatened Central Valley Spring-Run Chinook Salmon, Its Habitat, and Critical Habitat of the Central Valley Steelhead;

- Protest Dismissal Agreement Between Delta Wetlands Properties and East Bay Municipal Utility District;

- Agreement to Resolve Certain Delta Wetlands Permit Issues Between Delta Wetlands Properties and California Urban Water Agencies; and

- Protest Dismissal Agreement Between Contra Costa Water District and Delta Wetlands Properties.

National Marine Fisheries Service Biological Opinion for the Central Valley Steelhead

MAY 22 2000

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

May 19, 2000

In response reply to:
F-SA-00-04:MCV

Mr. Michael Finan
Chief, Delta Office
U.S. Army Corps of Engineers, Regulatory Branch
1325 J Street
Sacramento, California 95814-2922

Dear Mr. Finan:

This is in response to your letters of July 20, 1999 and November 29, 1999 requesting the adoption of the National Marine Fisheries Service's (NMFS) June 26, 1997 conference opinion for the Central Valley Evolutionarily Significant Unit (ESU) steelhead (*Oncorhynchus mykiss*)(Central Valley steelhead) as its final biological opinion for the proposed Delta Wetlands project (PN 190109804). In addition, your letter requests formal Section 7 consultation for the recently listed spring-run chinook salmon (*O. tshawytscha*), and concurrent consultation for Essential Fish Habitat for the Central Valley steelhead, spring-run chinook salmon, and the winter-run chinook salmon.

On August 9, 1996, NMFS proposed to list the Central Valley steelhead as endangered under the Endangered Species Act (ESA). On March 19, 1998 NMFS published in the **Federal Register** its final determination to list the Central Valley steelhead as threatened, effective May 18, 1998. On February 16, 2000 NMFS published its final rule for the designation of Critical Habitat for the Central Valley steelhead, effective March 17, 2000.

While the Central Valley steelhead was under consideration for listing under the ESA, NMFS issued a conference opinion to the U.S. Army Corps of Engineers (USACE) dated June 26, 1997, for the Delta Wetlands project. This conference opinion concluded that the proposed construction and operation of the Delta Wetlands water storage project was not likely to jeopardize the continued existence of the Central Valley steelhead. Should the Central Valley steelhead be listed subsequent to this opinion, Part VII of this opinion advised the USACE to request in writing that NMFS adopt the conference opinion as its final biological opinion. If neither the project activities considered in the conference opinion nor the information on which the conference opinion was based had changed, NMFS would adopt the conference opinion as its biological opinion.

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Based on Ms. Barbara A. Brenner's (Ellison & Schneider Attorneys at Law) August 6, 1999 declaration that the Delta Wetlands project activities have not changed, and NMFS review of the information on which the final conference opinion was based, NMFS adopts the final conference opinion as its biological opinion for the threatened Central Valley steelhead. In addition, NMFS concludes that based on the analysis of effects in the conference opinion, this action is not likely to result in the adverse modification of Central Valley steelhead critical habitat.

Your letter also requested formal Section 7 consultation for Central Valley spring-run chinook salmon. The spring-run chinook salmon was proposed for listing March 9, 1998, and subsequently listed as threatened on September 16, 1999. The Delta Wetlands project lies within the critical habitat for the spring-run chinook salmon designated February 16, 2000. As requested, NMFS will prepare a biological opinion for the spring-run chinook salmon. We anticipate that consultation can be completed using the existing information contained within our files, however, we may request additional information if needed to complete consultation.

Essential Fish Habitat (EFH) Conservation Recommendations are required by the Magnuson-Stevens Fishery Conservation and Management Act, as amended (16 U.S.C. 1801 et seq.) to protect important marine and anadromous fish habitat. While the Pacific Fisheries Management Council has recommended an EFH identification for the Pacific salmon fishery it has yet to be approved by the Secretary of Commerce, however, if approval occurs before the Delta Wetlands project is finalized, a detailed response in writing will be necessary, describing the measures proposed for avoiding, mitigating, or offsetting the impacts of the project on EFH. To assist you in an analysis of aquatic areas that may be identified as EFH for salmon within the project area, we will attach EFH Conservation Recommendations to our biological opinion for Central Valley spring-run chinook salmon.

We appreciate your continued cooperation in the conservation of listed species and their habitat, and look forward to working with you and your staff in the future. If you have any questions regarding this response, please contact Ms. Martha Volkoff in our Sacramento Area Office (650 Capitol Mall, Suite 6070, Sacramento, CA 95814). Ms. Volkoff may be reached by telephone at (916) 498-6488.

Sincerely,

for Rodney McInnis
Acting Regional Administrator

cc: Barbara Brenner, Ellison & Schneider Attorneys at Law
Cay Goude, USFWS Sacramento
NMFS-PRD, Long Beach, CA
Sacramento Admin file

National Marine Fisheries Service Biological Opinion for the Central Valley Spring-Run Chinook Salmon

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

AUG 29 2000

IN RESPONSE REFER TO:
F-SA-00-5:MCV

Mr. Michael Finan
Chief, Delta Office
U.S. Army Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Dear Mr. Finan:

Please find the enclosed National Marine Fisheries Service's (NMFS) final biological opinion concerning the effects of the proposed construction and operation of the Delta Wetlands (DW) project (Project Number 190109804) on the threatened Central Valley spring-run chinook salmon (*Oncorhynchus tshawtscha*) (spring-run chinook salmon), its critical habitat, and critical habitat of the Central Valley steelhead (*O. mykiss*) (steelhead).

The biological opinion concludes that the Corps of Engineers' issuance of a Department of Army permit for the DW project is not likely to jeopardize the continued existence of the spring-run chinook salmon, nor result in the adverse modification of spring-run chinook salmon critical habitat or steelhead critical habitat. Because NMFS believes there will be some incidental take of spring-run chinook salmon as a result of project operations, an incidental take statement is also attached to the biological opinion. This take statement includes several reasonable and prudent measures that NMFS believes are necessary and appropriate to reduce, minimize, and monitor project impacts. Terms and conditions to implement the reasonable and prudent measures are presented in the take statement and must be adhered to in order for take incidental to this project to be authorized.

As with the prior biological opinion for the Sacramento winter-run chinook salmon (*O. tshawtscha*) and Central Valley steelhead, this incidental take statement does not provide incidental take authorization for the re-diversion of DW discharges by other parties, including the Delta pumping plants operated by the Central Valley Project (CVP) or the State Water Project (SWP). The operations of these facilities and the related incidental take of listed salmonids are covered under the CVP-OCAP biological opinions issued by NMFS to the Bureau of Reclamation. Should changes in export operations of the CVP or SWP increase as a result of DW operation, NMFS anticipates that the Bureau of Reclamation and the Department of Water Resources will confer with our office on these changes in their project's operation.

Finally, the biological opinion also provides several advisory conservation recommendations for spring-run chinook salmon that include the use of levee maintenance procedures that will increase or enhance the quantity and quality of riparian habitat, and studies designed to explore juvenile salmonid rearing and migratory behaviors in the Sacramento-San Joaquin Delta.

This document also transmits NMFS' tentative essential fish habitat (EFH) Conservation Recommendations for chinook salmon (Oncorhynchus tshawytscha) as required by the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) as amended (16 U.S.C. 1801 et seq.). While EFH designations for salmon have yet to be approved by the Secretary of Commerce, we expect them to be forthcoming and provide these recommendations to facilitate your consultation obligations.

Once the EFH designations for chinook salmon are approved, the Corps has a statutory requirement under section 305(b)(4)(B) of the MSFCMA to submit a detailed response in writing to NMFS that includes a description of measures proposed for avoiding, mitigating, or offsetting the impact of the activity on EFH, as required by section 305(b)(4)(B) of the MSFCMA and 50 CFR 600.920(j) within 30 days. If unable to complete a final response within 30 days of final approval, the Corps should provide NMFS an interim written response within 30 days. The District should then provide a detailed response.

We appreciate your continued cooperation in the conservation of listed species and their habitat, and look forward to working with you and your staff in the future. If you have any questions regarding this response, please contact Ms. Martha Volkoff in our Sacramento Area Office, 650 Capitol Mall, Suite 6070, Sacramento, CA 95814. Ms. Volkoff may be reached by telephone at (916) 498-6488 or by FAX at (916) 498-6697.

Sincerely,

Rodney R Mihaus

for Rebecca Lent, Ph.D.
Regional Administrator

cc: Cay Goude, USFWS, Sacramento
D. McKee, CDFG, Sacramento
NMFS - Sacramento Admin File

BIOLOGICAL OPINION

Agency: Sacramento District, U.S. Army Corps of Engineers

Activity: Delta Wetlands (PN 190109804)

Consultation Conducted By: Southwest Region, National Marine Fisheries Service

Date Issued: AUG 29 2000

I. BACKGROUND

The U.S. Army Corps of Engineers (USACE) first requested formal consultation pursuant to section 7 of the Endangered Species Act (ESA) with the National Marine Fisheries Service (NMFS) on the Delta Wetlands Project (DW) in January, 1991. However, concerns with the 1991 DW proposal resulted in its withdrawal for revision by the project proponents.

A biological assessment for the revised DW proposal was prepared by Jones & Stokes Associates (JSA) and submitted to NMFS on June 21, 1995. Formal consultation for the endangered winter-run chinook salmon was initiated by the USACE with NMFS on July 10, 1995. The draft environmental impact report and environmental impact statement (DEIR/EIS) for the revised DW proposal were released on September 11, 1995.

Early in the consultation period, questions about DW and the interrelated and interdependent water export operations at the Federal Central Valley Project (CVP) and State Water Project (SWP) were raised by the U.S. Fish and Wildlife Service (FWS), the California Department of Fish and Game (CDFG), and NMFS. As proposed by DW, the CVP and SWP pumping plants in the Sacramento-San Joaquin Delta would increase water exports from the Delta above current levels. However, the U.S. Bureau of Reclamation (Reclamation) and the California Department of Water Resources (DWR) were not participants in this section 7 consultation and consistency with the existing biological opinions for CVP/SWP issued by NMFS (2/13/93 and amended 5/95) and FWS (3/6/95) was unclear. To address this issue, the USACE, NMFS, FWS and DW agreed at a meeting on February 1, 1996 that the consultation would: (1) assess the construction and operation of all DW facilities, (2) assess the diversion of water from, and discharge of water to, adjacent waterways within the Delta, and (3) assess reasonably foreseeable impacts resulting from CVP/SWP export operations associated with DW discharges. However, it was also agreed that the incidental take of listed species at the CVP/SWP facilities would be addressed and authorized through the existing biological opinions issued to Reclamation and DWR for the long-term operations of the CVP/SWP.

Based on discussions and analysis during 1995 and early 1996 consultation meetings, the DW project proposal was further revised to include measures to reduce potential adverse effects to listed species. This mitigation plan was submitted to NMFS and FWS by the USACE on February 20, 1996, and NMFS issued a draft biological opinion based on this mitigation plan to the USACE on June 28, 1996.

In response to the March 29, 1996 draft FWS biological opinion and reasonable and prudent alternative for the listed delta smelt and proposed Sacramento splittail, DW requested that the USACE delay their comments on the NMFS and FWS draft biological opinions until agreement regarding the operations of the DW project could be reached. On May 13, 1996, the USACE requested that NMFS and FWS deliver their final biological opinions 60 days after the receipt of USACE comments on the draft biological opinions. These comments were delayed to explore other operational scenarios that would not jeopardize a listed species.

On September 12, 1996, the USACE requested formal conferencing on the impacts of the DW project on the proposed as endangered Central Valley Evolutionarily Significant Unit (ESU) steelhead trout (steelhead).

Further discussions on potential measures to avoid or reduce impacts to listed species continued until early February, 1997, resulting in an operations matrix of measures to reduce impacts to listed species. On February 21, 1997, the USACE transmitted their formal comments on the NMFS draft biological opinion and DW's proposed mitigation measures to reduce impacts to listed species, thereby starting the 60-day clock for delivery of the final opinion. The final biological opinion for the Sacramento River winter-run chinook salmon (winter-run chinook salmon) and a draft conference opinion for the steelhead were issued on May 7, 1997. The final conference opinion for the steelhead was issued on June 26, 1997. Subsequent to final listing, the USACE requested by letter dated November 29, 1999 that NMFS adopt its final conference opinion for the steelhead as its final biological opinion. Because the conditions for converting the conference opinion to the biological opinion had been meet, NMFS converted the conference to the final biological opinion on May 19, 2000. The November 29, 1999 letter from the USACE also requested formal consultation on the Central Valley spring-run chinook salmon (spring-run chinook salmon), listed September 16, 1999. Critical habitat for the spring-run chinook salmon and steelhead were designated subsequent to the USACE reinitiation of consultation, but are also included in this consultation.

II. Proposed Activity

DW proposes a water storage project on four islands within the Sacramento-San Joaquin Delta: Bacon Island, Webb Tract, Bouldin Island, and Holland Tract. Bacon Island, Webb Tract, and Bouldin Island are owned by DW. Holland Tract is partially owned by DW. Bacon Island and Webb Tract will be managed as "reservoir islands". Surplus Delta inflows, transferred water, or banked water would be diverted by siphon onto the two reservoir islands for later sale and/or release for Delta export or to meet Bay-Delta estuary water quality or flow requirements. Bouldin Island and Holland Tract will be managed as "habitat islands" through wetland creation and wildlife habitat management. DW continues to pursue appropriated water rights for this project, but to date has not received approval from the State Water Resources Control Board (SWRCB). Public hearings are scheduled to resume October 10, 2000 at which time concerns not adequately addressed during the 1997 hearings can be presented to the Board.

Portions of the habitat islands will be flooded to shallow depths during the winter to attract wintering waterfowl and support private hunting clubs. Reservoir islands operations may include

shallow-water management during periods of non-storage at the discretion of DW and incidental to the proposed project.

Reservoir Islands

DW will undertake its diversion and discharge operations pursuant to the "final operations criteria," as defined in Appendix 1. Bacon Island and Webb Tract will be managed for year-round water storage. Two intake siphon stations and one discharge pumping station will be constructed along the perimeter of each reservoir island.

Each reservoir island will be designed for water storage levels up to a maximum pool elevation of +6.0 feet relative to mean sea level. The implementation of the final operations criteria, water availability, permit conditions, and requirements of the California Department of Water Resources Division of Safety of Dams may limit storage capacities and may result in a final storage elevation of less than +6.0 feet. The +6.0 feet pool elevation provides an initial estimated combined capacity of 238 thousand acre-feet (TAF) for Bacon Island (118 TAF) and Webb Tract (120 TAF). The total physical storage capacity of the islands may increase over time as a result of soil subsidence. Subsidence normally occurs at a rate of 2 to 3 inches per year. Due to the replacement of agriculture operations with water storage operations, this subsidence is estimated to occur at approximately 0.5 inches per year, resulting in an increase in combined storage capacity to 260 TAF in 50 years.

Diversion Operations: Water diversions onto the reservoir islands would occur when there is surplus water in the Delta under the requirements of the SWRCB's 1995 Water Quality Control Plan (WQCP). This surplus water is defined as the amount of water remaining within the specified export /inflow ratio for that month after all other WQCP requirements have been met and all senior water rights have been appropriated within these WQCP requirements and permitted pumping capacities. This would occur when two conditions are met: (1) all Delta outflow requirements are met and the export limit is exceeded; and (2) water that is available and is allowable for export is not being exported by the CVP and SWP pumps. For purposes of modeling, the second condition is assumed to occur only when water that is allowable for export exceeds the permitted pumping rate. However, the CVP and SWP may not be pumping at capacity because of low demands during the winter, and under these conditions the DW project will still be able to divert water for storage.

Because the reservoir islands will be managed for possible year round storage of water, there may be years during which multiple diversion and subsequent discharges of the reservoirs may occur. The reservoir islands will be filled, drawn down, and refilled in years when the operations criteria, water availability and demands allow. Multiple storage would generally occur during years of moderate precipitation. This management scenario depends on the availability of surplus water early in the year, and a demand for the water to allow an early discharge of the reservoir, followed by another period of available surplus water.

During years of low water demand, water would remain in the reservoirs at the end of the water year (i.e., September 30). Under the DW project, water could remain on a reservoir island for

release in subsequent years. Carry-over storage would generally occur during wet years with low demand.

Any diversion of water by DW will be controlled by its final operations criteria. These criteria set variable diversion rates and conditions based on a number of factors including: location of X2; delta smelt Fall Midwater Trawl Index values; and availability percentages applied to the total surplus water available, the previous day's net Delta outflow, and San Joaquin River inflow. These requirements are described in Appendix 1.

The timing and volume of diversions onto the reservoir islands will depend on how much water flowing through the Delta is not put to reasonable beneficial use by senior water-right holders or is not required for environmental protection. A procedure for coordinating daily DW project diversions with CVP and SWP operations will be established to ensure that DW project diversions capture only available Delta flows, satisfy 1995 SWRCB water quality objectives, and maximize efficiency of DW project water storage operations.

Diversion rates of water onto reservoir islands would vary with pool elevation and water availability. The initial diversion rate for each water year is limited to a combined maximum of 5,500 cfs for a five-day period. Thereafter, the maximum rate of diversion onto either Webb Tract or Bacon Island would be 4,500 cfs (9 TAF per day) at the time diversion begin (i.e., when the head differential between channel water elevation and the island bottom is greatest). The diversion rate would be reduced as reservoirs fill and head differentials diminish. The combined maximum daily average rate of diversion for all islands (including diversions to habitat islands) will not exceed 9,000 cfs. The proposed maximum average monthly diversion rate will be 4,000 cfs.

Discharge Operations: Export of DW project water would mainly take place at the CVP and SWP pumps. Discharges of water from the DW project islands would occur when the CVP/SWP pumping plants are not pumping at full capacity. DW discharge for export at the CVP/SWP would be regulated in a manner that the CVP/SWP export limits, as defined by the WQCP, are not exceeded. Actual timing and volume of discharges from the reservoir islands will depend on periods of demand, Delta regulatory limitations, and CVP/SWP export pumping capacities. For the purposes of this biological opinion, discharges from the DW project islands are not counted as inflow to the Delta, as defined by the 1995 WQCP. Treatment of DW discharges as Delta inflow will constitute new information and may require further consultation.

Discharge of DW project water will occur pursuant to DW's final operations criteria as set out in Appendix 1. Stored water will be discharged from reservoir islands during periods of demand, subject to Delta regulatory limitations and export pumping capacities. Discharges will be pumped at a combined maximum daily average of 6,000 cfs per reservoir island. Combined monthly average reservoir island discharge will be up to 4,000 cfs. Pump stations will discharge under the surface of receiving channel water.

DW's final criteria have several limitations on discharge operations, including: no discharges for export from Webb Tract from January through June; limiting discharges from Bacon Island from

April through June to 50% of San Joaquin River flows at Vernalis; and percentage limitations on discharges form February through July based on unused export capacity at the CVP/SWP pumps.

Shallow Water Management: Incidental to project operations and at times when water is not being stored, the project may include shallow water management on Bacon Island and Webb Tract to enhance forage and cover for wintering waterfowl. From September through May, reservoir islands may be flooded to shallow depths (approximately 1 foot of water per acre for wetland) to create habitat, typically 60 days after reservoir drawdown. During years of late reservoir drawdown, additional time may be necessary before shallow flooding begins to allow seed crops to mature. Once shallow water flooding for wetland management occurs, water will be circulated through a system of inner levees until deep flooding occurs or through April or May. If reservoir islands are not deeply flooded by April or May, water in seasonal wetlands will be drawn down in May, and if no water is available for storage, island bottoms will remain dry until September when the cycle may be repeated. DW project water used for shallow water flooding in April and May may be available for sale.

Siphon Station Design: Two new siphon stations for water diversions will be installed along the perimeter of each reservoir island. Each station would consist of 16 siphon pipes, each 36 inches in diameter. Screens to prevent entrainment of fish in diversions will be installed around the intake end of each existing and new siphon pipe. The individual siphons will be placed at least 40 feet apart to incorporate fish screen requirements. Existing reservoir island siphons may be used to create shallow water wetland habitat. In-line booster pumps will be available on the reservoir islands to supplement siphon capacity during the final stages of reservoir filling.

Pump Station Design: One discharge pump station will be located on each reservoir island. Webb Tract will have 32 new pumps and Bacon Island will have 40 new pumps, each with 36-inch-diameter pipes discharging to adjacent Delta channels. Typical spacing of the pumps will be 25 feet on center. An assortment of axial-flow and mixed-flow pumps will be used to accommodate a variety of head conditions through drawdown. Actual discharge rates for each pump will vary with pool elevations. As water levels decrease on the islands, the discharge rate of each pump will decrease. Existing pump stations on the islands may be modified and used when appropriate to help with dewatering or for water circulation to improve water quality. Pump station pipes will discharge underwater to adjacent Delta channels through a 3-foot by 10-foot expansion chamber, protected by guard piles adjacent to the expansion chambers and riprap on the channel bottom to protect against erosion.

Levee Improvements and Maintenance: Exterior levees on the reservoir islands will be improved to bear the stress and potential erosion caused by interior island water storage and drawdown. The perimeter levees on reservoir islands will be raised and widened to hold water at a maximum elevation of +6.0 feet. Levee improvements will be designed to meet or exceed criteria for levees outlined in DWR Bulletin 192-82. Levee design will address control of wind and wave erosion through placement of rock revetment on levee slopes, and control of project-related seepage through an extensive monitoring and control system. Maintenance activities would include, but are not limited to, placement of fill material, placement or installation of erosion protection

material, reshaping or grading of fill material, herbicide application, selective burning, and regrading or patching of the levee road surface.

Exterior levees on all four islands will be buttressed and improved as described here. In addition, and inner levee system will be constructed and maintained within the islands. This system will consist of a series of low-height levees and connecting waterways to facilitate the management of shallow water during periods of non-storage. The inner levees will be broad, earthen structures similar to those currently in place on existing farm fields.

Habitat Islands

As proposed, Bouldin Island and Holland Tract would be dedicated to management of wildlife and wetland habitat values to offset impacts to terrestrial wildlife and wetlands resulting from operations of the two reservoir islands. A variety of habitats will be created or protected to provide foraging and breeding habitats for a wide range of wildlife and waterfowl species. DW will not discharge for export or rediversion any water from the habitat islands.

Wetland management on the habitat islands will require grading areas, re-vegetating, and diverting water. Improvements will be made to existing pump and siphon facilities, and to perimeter levees, including levee buttressing to meet DWR's recommended standards for levee stability and flood control. No new siphon or pump stations will be constructed on habitat islands. Recreation facilities will be constructed on perimeter levees. Routine levee maintenance activities would not differ from current practices including replenishing riprap, placing fill material, grading, discing, mowing, selectively burning, controlling rodents, and installing rock revetment.

Diversions and Discharges: Bouldin Island and Holland Tract will be managed for improvement and maintenance of wetland and wildlife values through use of a Habitat Management Plan (HMP). The HMP was primarily developed (and finalized in the early 1990s) by CDFG and DW to address project effects on waterfowl. The timing and volume of diversions onto the habitat islands will depend on the needs of wetland and wildlife habitats. Wetland diversions will typically begin in September, and water will be circulated throughout the winter. Existing siphons will be used for diversions to the habitat islands. Fish screens will be installed on all siphons used for diversions.

The maximum rate of proposed diversions onto Holland Tract and Bouldin Island will be 200 cfs per island. Diversions onto the habitat islands will not cause the combined daily average maximum diversion rate of 9,000 cfs for all four project islands to be exceeded. Water will be applied to the habitat islands for management in each month of the year to maintain acreages of open water, perennial wetlands, flooded seasonal wetlands, and irrigated crop lands specified in the HMP. For the purposes of this biological opinion, habitat island discharges shall be treated as not available for sale, export, or rediversion. Sale, export, or rediversion of habitat island discharges will constitute new information and may require further consultation.

Operation and Maintenance: Operation and maintenance activities will include: (1) siphon and pump unit operations and routine maintenance; (2) management of habitat areas, including (but not limited to) the control of undesirable plant species, the maintenance or modification of inner levees, and water circulation in ditches, canals, open water and shallow flooded habitats to facilitate flooding and drainage; (3) fish screen maintenance and monitoring during water diversions for habitat maintenance; (4) wildlife and habitat monitoring under the HMP; (5) perimeter levee inspections and maintenance; (6) aircraft operations for seeding, fertilizing, etc.; (7) operation of recreational facilities using seasonal workers; and (8) monitoring and enforcement of hunting restrictions.

Recreation Facilities

DW proposes to construct 11 recreational facilities on each reservoir island and 10 new recreation facilities on Bouldin Island and 6 new recreation facilities on Holland Tract. Specific types of facilities have not been described by DW. Each recreational facility will be constructed on approximately 5 acres and will include vehicle and boat access. A total of 1200 boat docks and 1472 piles will be placed around exterior island levees in association with the recreational facilities and siphon/pumping stations. The Bouldin Island airstrip will be available for use by hunters and other recreationalists to fly to the island.

Fish Screens

For all four islands, fish screens will be installed around the intake of each existing and new siphon to prevent entrainment and impingement of all adult and most juvenile fish that are present in the Delta. The DW fish screens will maintain a 0.2 fps approach velocity for diversions. The average approach velocity will decrease rapidly as the islands are filled because of decreases in siphon head differential. The preliminary fish screen design consists of a barrel-type screen on the inlet side of each siphon with a hinged flange connection at the water surface (for cleaning). Each siphon opening will be enclosed by a stainless steel, woven wire mesh consisting of seven openings per inch in a screen of 0.035-inch-diameter number 304 stainless steel wire with a pore diagonal of 0.1079 inch. Siphon pipes, with their individual screen modules, will be spaced approximately 40 feet apart on center. Final design elements and installation guidelines will be subject to approval by the USACE and SWRCB with concurrence by FWS, CDFG and NMFS.

III. Listed Species

Central Valley Spring-run Chinook Salmon ESU and Critical Habitat

The Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*)(spring-run chinook salmon) was determined by NMFS to be a unique ESU, endemic to the Central Valley of California. The State of California listed the spring-run chinook salmon as threatened species under the California State Endangered Species Act February 1999, followed by federal listing as a threatened species under the ESA (September 1999). In February 2000, NMFS designated critical habitat for the spring-run chinook salmon as all river reaches accessible to listed chinook

salmon in the Sacramento River and its tributaries in California. Also included are river reaches and estuarine areas of the Sacramento-San Joaquin Delta, all waters from Chipps Island westward to Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Strait, all waters of San Pablo Bay westward of the Carquinez Bridge, and all waters of San Francisco Bay (north of the San Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge (50 CFR Part 226).

Chinook salmon range along the North Coast from Kotzebue Sound, Alaska to Central California (Healey 1991). Within California there are two distinct spring-run populations; the North Coast Klamath-Trinity and the Central Valley populations. Chinook salmon runs can be differentiated by timing of spawning migration, degree of maturity of fish when entering freshwater, spawning areas, and the emigrating time of the juveniles (DFG 1998).

Adult Central Valley spring-run chinook salmon migrate between March and September, peaking in May through June, and spawn from late August through early October, peaking in September (Yoshiyama et al. 1998). Between 56 to 87 percent of adult spring-run chinook salmon enter freshwater to spawn are three years of age (Calkins et al. 1940, Fisher 1994). Spring-run chinook salmon in the Sacramento River exhibit an ocean-type life history, emigrating to the ocean as fry, subyearlings, and yearlings. Juvenile spring-run chinook salmon may spend several months resting and feeding in the Delta and Estuary for several months prior to entering the ocean (Kjelson et al. 1981).

Central Valley spring-run chinook salmon differ from Central Valley fall-run chinook salmon in timing of migration, adult size, fecundity, and smolt size. The spring chinook salmon run timing enables fish to gain access to the upper reaches of river systems prior to the onset of prohibitively high water temperatures and low flows that inhibit access to these areas during the fall. Fish hold over throughout the summer in these cool upper reaches until reaching sexual maturity and subsequently spawn between August and October (Yoshiyama et al. 1998).

Historically, spring-run chinook salmon were abundant in the Sacramento River system and constituted the dominant run in the San Joaquin River Basin (Reynolds et al. 1993), occupying the upper and middle reaches (450-1,600 m in elevation) of the San Joaquin, American, Yuba, Feather, Sacramento, McCloud and Pit Rivers. Smaller sustaining populations were found throughout most other tributaries with sufficient cold-water flow to maintain spring-run adults through the summer prior to spawning (Stone 1874, Rutter 1904, Clark 1929, Meyers 1998).

Clark (1929) estimated that there were historically 6,000 stream miles of salmonid habitat in the Sacramento-San Joaquin River Basin, but by 1928 only 510 miles remained. The elimination of access to spawning and rearing habitat resulting from the construction of impassable dams has extirpated spring-run chinook salmon from the San Joaquin River Basin, historically supported the greatest numbers of spring-run chinook salmon. Construction of impassible dams has also curtailed access to suitable spawning habitat in the upper Sacramento and Feather Rivers.

The remaining streams believed to sustain populations of wild spring-run chinook salmon are Mill and Deer Creeks, and possibly Butte Creek (tributaries of the Sacramento River). These

remaining populations are relatively small and exhibit a sharply declining trend. Demographic and genetic risks of extirpation due to small population size are thus considered to be high. Spring-run chinook salmon are unable to access historical spawning and rearing habitats in the Sacramento and San Joaquin River Basins are restricted to spawning in the mainstem tributaries of the Sacramento River. This limited spawning habitat, as well as corridors used for migration, are substantially marred by elevated water temperatures, agricultural and municipal diversions and returns, restricted and regulated flows, entrainment of migrating fish into unscreened or poorly screened diversions, and the poor quality and quantity of remaining habitat.

Central Valley Steelhead Critical Habitat

On March 19, 1998 NMFS published its final rule (47 CFR Part 73) to list two ESU(s), the Lower Columbia River and the Central Valley, California, as threatened under the ESA. Subsequent to their listing, NMFS designated critical habitat for the Central Valley steelhead ESU (*Oncorhynchus mykiss*)(steelhead) on February 16, 2000 (50 CFR Part 226).

Critical habitat is designated to include all river reaches accessible to listed steelhead in the Sacramento and San Joaquin Rivers and their tributaries in California. Also included are river reaches and estuarine areas of the Sacramento-San Joaquin Delta, all waters from Chipps Island westward to Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Strait, all waters of San Pablo Bay westward of the Carquinez Bridge, and all waters of San Francisco Bay (north of the San Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge. Excluded are areas of the San Joaquin River upstream of the Merced River confluence and areas above specific dams or longstanding, naturally impassable barriers.

IV. ENVIRONMENTAL BASELINE

Sacramento-San Joaquin Delta: The Sacramento River Basin provides approximately 75% of the water flowing into the Delta (DWR 1993). With the completion of upstream reservoir storage projects, the Sacramento River, San Joaquin River, and Delta waterways are now highly regulated systems, such that the current seasonal distribution of flows differs from historical patterns. The magnitude and duration of peak flows during the winter and spring are reduced by water impoundment in upstream reservoirs. Instream flows during the summer and early fall months have increased over historic levels for deliveries of municipal and agricultural water supplies. Overall, water management now reduces natural variability by creating more uniform flows year-round.

To a great extent, stremflow volume and runoff patterns regulate the quality and quantity of habitat available to juvenile salmonids. Salmon are highly adapted to seasonal changes in flow. Increased stream flows in the fall and winter stimulate juvenile salmonid downstream migration, improve rearing habitat, and improve smolt survival to the ocean. Over the last few years an increasing trend has been noted in the size of the winter-run chinook salmon run. This increase has been attributed to a number of factors, including favorable environmental conditions, implementation of temperature controls on water released from storage, modified operations of the Red Bluff Diversion Dam, and screening of select diversions. However, increasing trends

have not been noted for the remaining ESU(s) that may be more greatly influenced by changes in natural flow in the Delta waterways from CVP/SWP pumping in the south Delta. These conditions have adversely affected Central Valley salmonids, including the spring-run chinook salmon, through reduced survival of juvenile fish.

Juvenile salmon migrate downstream from their upper river spawning and nursery grounds to lower river reaches and the Delta prior to entering the ocean as smolts. Historically, the tidal marshes of the Delta provided a highly productive estuarine environment for juvenile anadromous salmonids. During the course of their downstream migration, juvenile spring-run chinook utilize the Delta's estuarine habitat for seasonal rearing, and as a migration corridor to the sea. Since the 1850's, reclamation of Delta islands for agricultural purposes has caused the cumulative loss of 94 percent of the Delta's tidal marshes (Monroe and Kelly 1992).

In addition to the degradation and loss of estuarine habitat, downstream migrant juvenile salmon in the Delta are currently subject to adverse conditions created by water export operations at the CVP/SWP. Specifically, juvenile salmon are adversely affected by: (1) water diversion from the mainstem Sacramento River into the Central Delta via the manmade Delta Cross Channel, Georgiana Slough, and Three-mile Slough; (2) upstream or reverse flows of water in the lower San Joaquin River and southern Delta waterways; and (3) entrainment at the CVP/SWP export facilities and associated problems at Clifton Court Forebay. In addition, salmonids are exposed to increased water temperatures from late spring through early fall in the lower Sacramento and San Joaquin River reaches and the Delta. These temperature increases are primarily caused by the loss of riparian shading and thermal inputs from municipal, industrial, and agricultural discharges.

Diversion into the Central and South Delta: Juvenile salmon emigrating from spawning and rearing areas in the Sacramento River may be diverted into the interior Delta through the manmade Delta Cross Channel, Georgiana Slough, or Three-mile Slough. Fisheries investigations by Schaffter (1980) and Vogel et al. (1988) using winter-run chinook salmon juveniles suggests that the number of salmon diverted into the central and South Delta are proportion to flow into the central Delta at the Delta Cross Channel.

Studies conducted using fall-run chinook salmon smolts have demonstrated substantially higher mortality rates for those fish passing into the interior Delta (FWS 1990 and FWS 1992). The increased mortality rates reflect increased susceptibility to predation, delays in migration, exposure to increased water temperatures, and increased susceptibility to entrainment losses at the CVP/SWP export pumps and other water diversion locations within the Delta.

Reverse Flow: Channel hydrodynamics in the lower San Joaquin River and other southern Delta waterways are altered by CVP/SWP water export operations in the south Delta. CVP/SWP pumping can change the net flow in these channels from a westward direction to an eastward direction, particularly during periods of drought and high pumping rates. When present, these 'reverse' flows move the net flow of water east up the San Joaquin River and then south towards the CVP/SWP export facilities, via Old and Middle Rivers. In general, the magnitude of reverse flow increases with the rate of export pumping. Although the mechanism is not well understood,

juvenile salmon frequently pass with the net flow of water into a complex network of channels leading to the CVP/SWP water export facilities in the South Delta. Indirect losses of juvenile salmon are thought to occur in these southern Delta channels through predation, disorientation, and delayed out-migration. Direct losses to predation and entrainment are known to occur in Clifton Court Forebay and at the CVP/SWP pumping plants.

Entrainment at CVP/SWP and Clifton Court Forebay: The CVP and SWP Delta pumping plants presently have maximum capacities of 4,600 cfs and 10,300 cfs, respectively. However, the State's existing USACE permit generally restricts the SWP's level of pumping by limiting the monthly maximum average inflow into Clifton Court Forebay to 6,680 cfs. Both projects operate fish collection facilities within the intake channels of their canals using a louver system which resembles venetian blinds and acts as a behavioral barrier. Although the slots are wide enough for fish to enter, approximately 75 percent of the chinook salmon encountering the louvers sense the turbulence and move along the face of the louvers to enter the bypass system. The remaining 25 percent are lost to the pumping plant and canal. Additional losses occur inside the fish screening facilities from predation to striped bass and other predators. Significant handling and trucking losses also occur during the process used to transport salvaged fish to a release site in the western Delta.

Clifton Court Forebay is a 31 TAF regulating reservoir at the pump intake to the SWP's California Aqueduct. The forebay is operated to minimize water level fluctuations at the intake by draining water through open gates at high tide and closing the gates at low tide. When the gates are opened, inflow can exceed 20,000 cfs for a short time and then decreases as the water levels inside and outside the forebay reach equilibrium. Within the forebay, juvenile salmon are subject to severe predation loss. In a series of investigations by CDFG, predation loss rates of marked hatchery fall-run salmon released in Clifton Court Forebay during April, May, and June ranged from 63 to 97 percent.

Delta Water Quality: Increased water temperatures, insufficient dissolved oxygen, and contaminants have degraded the aquatic habitat quality of rearing and migrating salmonids. Discharges from industrial and agricultural sources have led to increased water temperatures and contaminant levels. Water temperatures typically exceed 60 or 66 degrees Fahrenheit from April through September. Contaminants such as mercury from mine discharges may be well above 'safe' levels for beneficial uses in the Delta. Dissolved oxygen (DO) levels are affected by municipal, industrial, and agricultural discharges. Salmonids function normally at DO levels of 7.75 mg/L and may exhibit distress symptoms at 6.0 mg/L (Reiser and Bjornn 1979). Low dissolved oxygen levels impair metabolic rates, growth, swimming ability, and the overall survival of young salmonids.

Current Operations Under the Bay-Delta Accord and 1995 WQCP: Significant actions to protect beneficial uses in the Delta were initiated by a three-year agreement between the Federal government, State of California, water users, and environmental interests in the Bay-Delta Accord of December 15, 1994 (Accord). Through the Accord and the 1995 WQCP, water quality objectives for the protection of fish and wildlife have been established for the following parameters: dissolved oxygen, salinity, Delta outflow, river flows, export limits, and Delta Cross

Channel gate operation. An "operations" group (CALFED Ops Group) coordinates CVP/SWP projects operations, using current biological and hydrological information for the management of water quality, endangered species, and the Central Valley Project Improvement Act. Water quality objectives and criteria established by the Accord are based on historical operations of the CVP/SWP and the life history needs of the fish species affected by Delta water operations. The combined effect of these various criteria seems to have improved the environmental baseline of the Delta to a level which provides adequate protection for the conservation of listed species and critical habitat.

Small scale restoration projects are being undertaken in many locations throughout the Delta, including restoration of Decker, Twitchell, and Bradford Islands. But paramount to these efforts is the approaching implementation of CALFED, a long-term restoration and management plan for the Bay-Delta estuary. This effort to balanced the water needs of all parties has brought together the private stakeholders, the public, and state and federal agencies. Through its implementation, CALFED seeks to restore ecological health to the Bay-Delta estuary and throughout the entire Sacramento River-San Joaquin River watershed, improve the quality and supply of water to the state, and protect the sustainability of the water supply. The goal of CALFED's Ecological Restoration Program (ERP) "is to improve aquatic and terrestrial habitats and natural processes to support stable, self-sustainable populations of diverse and valuable plant and animal species, and includes recovery of species listed under the State and Federal Endangered Species Acts" (CALFED 2000). Examples of activities to be implemented include large-scale restoration projects on Clear Creek, Deer Creek, and the San Joaquin River, removal of select dams, purchase of additional upstream flows, protection and restoration of the natural meander corridor to the Sacramento River, and improvement of water quality throughout the watershed.

V. Assessment of Impacts

The DW project operations are likely to adversely effect the endangered spring-run chinook salmon and diminish some of the fisheries habitat benefits gained in the Bay-Delta Accord. Juvenile spring-run chinook salmon will be adversely affected through reduced Delta outflow, higher reverse flows in central and south Delta waterways, and entrainment in local diversions of the central and southern Delta, and entrainment at the CVP/SWP pumping plants or habitat island drawdowns. Some construction related impacts may occur, but are likely to be minor in nature.

Hydrologic data discussed in the assessment of impacts which follows were provided by JSA. The results of JSA's computer model analyses were provided to NMFS in a December 20, 1996 memorandum analyzing the proposed operations matrix and the no-project alternative, or baseline condition[1]. These databases are used in the following assessment which focuses on the months of September through May to evaluate impacts to spring-run chinook salmon as well as winter-run chinook salmon and steelhead.

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[1] For the purposes of this biological opinion, the No-Project Alternative includes water project operations in the Central Valley Basin as defined by the 1995 WQCP and 1994 Accord.

A. Diversion Operations

The DW project proposal relies on diversions of 'surplus' Delta inflows during the winter and early spring months. DW project operations during the months of March and June through September coincide with the presence of spring-run chinook salmon in the Delta. DW will offer some protection to out-migrating juvenile spring-run chinook salmon by not diverting flows for storage between April and May. Depending on the presence of delta smelt in the area, diversions may be curtailed by 50% as early as February 15 and as late as June 30 to minimize entrainment of eggs or larvae, resulting in improved flows for migrating adult spring-run chinook salmon.

The inflow-export criteria[2] established by the Accord were developed to replace and lead to, at minimum, equivalency with the historic QWEST[3] criteria for protection of fish and wildlife, including the spring-run chinook salmon. Historic Delta inflows from upstream rivers and existing CVP/SWP operations under the inflow-export criteria were simulated by computer models to aid in the QWEST equivalency determination. In addition to the Accord's water quality criteria, the NMFS assessment and equivalency determination during the development of the Accord assumed the CVP and SWP exports were limited by: (1) current CVP/SWP pumping plant capacities, (2) existing Corps permits, (3) south of Delta storage capacity, (4) the independent operation of the CVP/SWP pumping plants under their existing State water rights, and (5) inflow originating from upstream sources. These limits on export and the Accord's criteria results in Delta conditions which are frequently above the minimum WQCP standards.

As proposed, DW diversion operations will frequently reduce Delta outflow. The decrease in outflow may reach an average daily maximum rate of 9,000 cfs and an average monthly maximum rate of 4,000 cfs. Delta outflows would be reduced by 5 percent or greater in approximately 10 percent of the simulated years (1922-1991) with a maximum reduction in outflow of 25 percent. On an annual basis, DW diversions would directly decrease outflow by a mean of 192 TAF and a maximum of 490 TAF. In comparison, the CVP and SWP export an average of 6.1 million acre feet per year. Water diversions to the DW islands will increase the percent of inflow diverted in all months of the year.

Project water diversions will also directly reduce the net western flow of freshwater in the central Delta (QWEST). Reduced QWEST in the central Delta will be in direct proportion to the DW diversion rate. DW diversions will also directly increase the net reverse flows down Old and Middle rivers between Webb Tract and Bacon Island by a maximum of 4,500 cfs.

Analysis of DW diversion opportunities shows that diversions onto the reservoir islands can occur as much as 36 percent of the time simulated during September through May. Table 1 presents the number of years by month over the 70 year model simulation that DW was able to

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[2] The Accord established inflow-export limits for the CVP/SWP pumping plants as 65 percent in September, October, November, December and January, 35-45 percent in February, and 35 percent in March, April and May.

[3] QWEST is the calculated estimate of the net flow from the central Delta to the western Delta. It represents the sum of the flows in the lower San Joaquin River, False River, and Dutch Slough. Negative QWEST values mean 'reverse flow', or net flow from the western Delta into the central Delta.

divert water onto the reservoir islands and the monthly average maximum diversion rate. Most DW diversion events occur in October through February.

Table 1. Diversion frequency during the 70 year modeled simulation and maximum diversion rates (cfs) (from JSA 1996).

	Diversions (years out of 70)	Average Maximum Rates of Diversion (cfs)
September	8	4,000
October	21	3,871
November	29	4,000
December	28	3,871
January	45	3,600
February	40	4,000
March	39	1,144
April	0	0
May	0	0

These changes in Delta hydrodynamics during the critical rearing and emigration period for juvenile spring-run chinook salmon is expected to adversely affect the species. Decreases in Delta outflow, increases in export-inflow levels, and reductions in QWEST are likely to reduce the survival of rearing and emigrating juvenile fish. Existing reverse flow conditions in the lower San Joaquin River, Old River, and Middle River will be exacerbated by DW diversions. Natural flow cues for emigrating spring-run chinook salmon smolts and migrating adults will be adversely affected. The number and rate of juvenile spring-run chinook salmon drawn from their typical migration route into central and southern Delta waterways is also likely to increase.

Once in the complex configuration of waterways in the central and southern Delta, fish are subjected to a variety of adverse conditions that decrease their chances for survival. Lower survival rates are expected due to the longer migration route, where fish are exposed to increased predation, higher water temperatures, unscreened agricultural diversions, poor water quality, reduced availability of food, and entrainment at the CVP/SWP export facilities. Through reduced Delta outflow and decreases in net westerly flow, DW diversion operations are expected to degrade chinook salmon rearing habitat in the Delta, degrade conditions for natural smolt out-migration stimulus and seaward orientation, and generally reduce smolt survival. During dry and critical water years, DW diversions have an even greater potential for adversely affecting channel hydrodynamics and reducing spring-run chinook salmon survival already strained by low flows, poor water quality, and high CVP/SWP entrainment rates.

Fish screens installed on all DW intakes are expected to adequately prevent the direct entrainment of juvenile spring-run chinook salmon onto DW reservoir and habitat islands. Eliminating existing unscreened diversions on DW reservoir and habitat islands is expected to provide a project benefit to spring-run chinook salmon.

B. Discharge Operations

As currently proposed, DW's discharge operations rely on the CVP/SWP pumping plants in the south Delta to transport project water to potential buyers. Export of DW discharges by the CVP/SWP is expected to increase spring-run chinook salmon losses in the Delta through entrainment, predation, and diversion with the net flow down Old and Middle Rivers.

During DW discharge operations, water will be released from the reservoir islands to Delta waterways for re-diversion at the CVP/SWP pumping plants. Water released from the habitat islands will not be available for re-diversion or export and should add to Delta outflow, providing some benefit to Delta species if the habitat island releases occur during favorable aquatic habitat conditions in the Delta. CVP/SWP export rates are expected to increase above baseline levels as a result of reservoir island releases. The frequency of CVP/SWP operations approaching or reaching maximum inflow-export levels will increase.

Analysis of DW discharge opportunities shows that discharges from the reservoir islands generally occur 14 percent of the simulated time from September through May. Most of these discharge events occur in April and May. Table 2 presents the number of years by month over the 70-year modeled simulation that DW was able to discharge water from the reservoir islands and the monthly average maximum discharge rate. Annual discharges from the DW reservoir islands range from zero to 306 TAF, with an average annual diversion of 154 TAF. Most annual DW discharge events occur in April through September.

Table 2. Discharge frequency during the 70 year modeled simulation and maximum discharge rates (cfs) (JSA 1996).

	Discharges (years out of 70)	Maximum Rates of Discharge (cfs)
September	15	1,777
October	8	962
November	5	743
December	6	1,758
January	2	956
February	5	1,742
March	4	1,088
April	20	450
May	29	599

Discharges from the DW reservoir islands would occur during critical rearing and emigration periods of the juvenile spring-run chinook salmon. These discharges to export at the CVP/SWP pumping plants will increase the reverse flows in Old and Middle Rivers by an average maximum of 1765, 1161, 500, and 660 cfs during February, March, April, and May, respectively, or by 25 percent, 19 percent, 8 percent, and 10 percent over average baseline conditions. Spring-

run chinook salmon enter the Delta as yearlings from November through April or more often as fry or fingerlings from March through June (Yoshiyama 1998). Smoltification is believed to occur as the juvenile salmon near the freshwater-saltwater transition. Delays in migration may be deleterious to smoltification. Spring-run chinook yearlings, fry, or fingerlings emigrating through the Central Delta may have difficulty following net flows to the ocean under conditions resulting from the operation of the Delta Wetlands Project. Proposed discharge prohibitions for Webb Tract during January through June should minimize potential adverse affects to emigrating juveniles from reverse flows. Additionally, DW opportunities for discharge to export at the CVP/SWP pumping plants increase during some dry and critical water year types. Discharges from the habitat islands may supply Delta channels with prey organisms of the spring-run chinook salmon, increased food availability and benefit rearing juveniles. Potential impacts from dissolved oxygen level reductions caused by high biological oxygen demand of the release water are addressed below.

C. Combined DW Operations Impacts to Baseline Conditions

Combined operations of the DW project include diversions of water onto, and discharge of water from, the reservoir and habitat islands. Since DW proposes to operate alternatively between diversions and discharges within a season, combined DW project operations and its effects on channel hydrodynamics must be assessed for periods of juvenile spring-run chinook salmon rearing and emigration.

Analysis provided by JSA indicates that many of the flow variables important to juvenile salmon survival in the Delta, such as outflow, QWEST, and flows in Old and Middle Rivers, are often negatively affected by DW operations.

Decreases in QWEST and outflow from baseline conditions in December through February by 1,000 cfs or greater occurred 14 to 20 percent of the time modeled (JSA 1996). Increases in QWEST and outflow values during February through May also occurred. These increases were generally less than 100 cfs, however there were several instances where the increases exceeded 100 cfs.

The combined effects of DW diversions onto Bacon Island and discharges from both reservoir islands increased the net southernly flow in the Old and Middle Rivers north of the export facilities. Increased reverse flows occurred from January through May with 40 and 55 percent of DW operations resulting in increased reverse flows in April and May. Reverse flows in Old and Middle Rivers increased by greater than 1,000 cfs during DW operations 6.0, 4.0, and 1.5 percent of the time in December, February, and March, respectively. DW operations in December showed an incremental improvement to reverse flow conditions in Old and Middle Rivers during 35 percent of DW operations. It is also important to consider that the JSA operations model simulates monthly average DW operations and monthly average Delta hydrological conditions. Daily conditions can vary widely from the monthly averages generated by the model and include other significant variables such as tidal fluctuations.

The combined operation of DW water diversions onto the reservoir islands, discharges into adjacent Delta waterways, and the subsequent export of DW water at the CVP/SWP pump plants is expected to directly and indirectly reduce the survival of juvenile spring-run chinook salmon in the Delta. Decreases in Delta outflow, higher net southerly flows in Old and Middle rivers, and decreases in QWEST adversely affect spring-run chinook salmon primarily through increased entrainment into the central and southern Delta waterways where they are subject to longer migration routes, increased predation, unscreened diversions, poor water quality, decreased westward flow cues, and losses at the CVP/SWP export facilities.

Appendix 2 shows average monthly values for CVP/SWP export levels, QWEST, Delta outflow, and Old and Middle Rivers flows for baseline and DW operations conditions. These values are generated form the DeltaSOS monthly modeling simulation results provided by JSA.

D. Specific Criteria Impacts

The following discusses the effects of specific proposed operational criteria on spring-run chinook salmon. These measures have been proposed by DW to minimize project impacts to the spring-run chinook salmon.

In general, most of the operational criteria proposed by DW for minimizing impacts do reduce the potentially significant adverse effects the project would have on the spring-run chinook salmon. Reductions in the rate and volume of diversions, required X2 positions for diversion initiation, and diversion prohibitions or limitations during sensitive periods all contribute to reduced degradation of the existing environmental baseline. Limiting diversions to a certain percentage of the Delta outflow in critical emigration months may provide significant reductions in the level of impact that would otherwise occur in critical or dry water year types.

Webb Tract discharge prohibitions from January through June avoid significant impacts to aquatic habitat quality in the Webb Tract vicinity that would have occurred during months of spring-run chinook salmon juvenile presence. Habitat island releases, which are not available for export or rediversion, should benefit juveniles present in the vicinity, provided the existing hydrologic conditions allow for proper environmental cues to emigrating salmonids.

Fish screens installed on all of the project intakes should eliminate entrainment of spring-run chinook salmon onto the project islands. The proposed fish screens will have a maximum approach velocity of 0.2 feet per second, which surpasses NMFS screening criterion for screens to protect anadromous salmonids. Final screen designs have yet to be reviewed by NMFS fish passage engineers.

Creating 200 acres of delta smelt rearing habitat and the replacement of lost aquatic habitat, due to construction related impacts, at a 3:1 ratio should also provide usable rearing habitat for salmonid juveniles. However, lost riparian and shaded riverine aquatic habitat (SRA), discussed below, is not currently mitigated. Proposed June through November construction windows will minimize construction related impacts to spring-run chinook salmon.

Measures proposed by DW for years in which the Fall Midwater Trawl Index of the delta smelt is less than 239 are more restrictive than the measures analyzed in this opinion, providing substantial reductions in project effects to spring-run chinook salmon, winter-run chinook salmon, and steelhead, when they are implemented. However, for the purposes of making determinations as to whether the DW project is likely to jeopardize the spring-run chinook salmon, only the 'base case' scenario of proposed operational criteria has been assessed.

E. Water Quality

Potential water quality impacts from DW project releases off of the reservoir and habitat islands include increased water temperatures and decreased dissolved oxygen (DO) levels. The months of April, May, and September often have Delta water quality conditions that are not suitable for salmonid rearing and migratory behaviors. DW proposes to increase water temperatures by a maximum of four degrees Fahrenheit when channel temperatures are between 55 and 66 degrees Fahrenheit and by a maximum of two degrees Fahrenheit when channel temperatures are 66 to 77 degrees Fahrenheit. At channel temperatures above 60 degrees, increases of up to four degrees Fahrenheit across the entire channel may cause physiological sublethal stress effects, impair predation avoidance abilities, terminate smoltification, and cause migration delays or blockages (Boles 1988, Brett 1982, Wedemeyer et al. 1980, Zaugg and Adams 1972). Higher temperatures decrease aquatic habitat productivity, while nutritive needs of salmonids increase. Impacts to salmonids may decrease if temperature changes affect only a portion of the channel, thereby allowing for avoidance of increased temperature plumes. Impacts to salmonids can be avoided if release-water temperatures are less than or equal to channel temperatures.

Island releases that cause local dissolved oxygen levels to drop below 6.0 mg/L may also cause sublethal physiological impacts to emigrating salmonids. Reiser and Bjornn (1979) found that salmonids exhibit various distress symptoms at 6.0 mg/L. Low dissolved oxygen levels impair metabolic rates, growth, swimming ability, and the overall survival of young salmonids. DW proposes to prohibit discharges when the island water DO is below 6.0 mg/L. Additionally, DW proposes to prohibit discharges that will cause a DO drop in the receiving water to below 5.0 mg/L. Localized DO drops to 5.0 mg/L may adversely affect rearing and emigrating juveniles if the drop affects the entire channel cross-section. Impacts to salmonids may be decreased if effects are temporary in nature or affect only a portion of the channel, thereby allowing for avoidance of decreased DO areas.

F. Levee Maintenance

While losses of low salinity or freshwater habitat from levee failure may be reduced through improved levee protection, maintenance of levees on the habitat and reservoir islands may result in damage or loss of riparian vegetation. Shaded riverine aquatic cover (SRA), or the zone of overhanging riparian vegetation along the stream banks, provides temperature moderation, protective cover, and allochthonous materials and energy input to the stream. It provides food and habitat for invertebrates that in turn become prey of salmonids and other fish. Removal of this vegetation, or large reductions in the quality and quantity of SRA vegetation eliminates these inputs from the stream and estuary. Juvenile spring-run chinook salmon rearing or emigrating

through areas that have suffered vegetation losses may be at a greater risk of predation, increased physiological stress from lack of cover and high temperatures, and have reduced food availability.

Permanent losses to this habitat are expected to occur during normal levee construction and maintenance if methods such as grading, riprap placement, herbicide application, selective burning and mowing are used. Approximately 152 acres of exterior levee slopes around the reservoir islands will be improved and maintained to protect the water storage capabilities of the islands. If strict vegetation control methods are used, existing vegetation on the project's 152 acres of levees may be permanently lost.

G. Recreation Facilities, Siphon Stations and Pumping Stations

Construction activities at the recreation and siphon/pump facilities may temporarily affect juvenile spring-run chinook salmon through disturbance or degradation of water quality. Boat wakes may increase levee erosion (increasing levee maintenance) and raise local turbidity levels. Increased inputs of oil and gasoline from increased boat traffic and storage will continue to degrade the water quality within the channels and reservoirs. Permanent impacts to spring-run chinook salmon rearing habitat may occur through destruction of shallow water vegetated habitat and the creation of predator habitat under docks and around siphon/pump station pilings. DW proposes to limit their construction activities to June through November to minimize construction related impacts to juvenile salmonids.

H. Delta Smelt Monitoring

DW proposes a sampling program in the vicinity of their reservoir islands from December through August to monitor the presence of delta smelt. Presence of delta smelt triggers 50 percent reductions in diversion and discharge activities on the reservoir islands. The sampling program may incidentally capture juvenile spring-run chinook salmon depending on gear types and sampling methodologies used. Results of this sampling may trigger the reduction in diversion and discharge of water, resulting in an overall benefit to spring-run chinook salmon. The final monitoring plan will be developed after issuance of this biological opinion.

I. Interrelated and Interdependent Effects of the CVP/SWP Operations

Modeling of CVP/SWP operations in coordination with DW discharge operations was performed by JSA with a Delta operations model (DeltaSOS). These results are presented in the BA and DEIR/EIS. While the DeltaSOS model uses results from the CVP/SWP operations model (DWRSIM), an integrated analysis of DW project operations with the participation of Reclamation (CVP) and DWR (SWP) has not been performed to date. Concern has been expressed that DW's analysis has not integrated some important components of CVP/SWP operations. Specifically, the re-operation of upstream reservoirs has the potential to adversely affect spring-run chinook salmon in the Sacramento River.

Although project proponents stated during consultation that they do not anticipate DW operations will result in the re-operation of upstream CVP ans SWP reservoirs, NMFS and the CVP/SWP water projects believe the potential does exist. In commenting on the DEIR/EIS, DWR expressed concern with JSA's model analysis for DW because: (1) the DeltaSOS model does not have the ability to account for upstream and downstream reservoir storage, and (2) there has been no consideration for real-time operational adjustment for reducing incidental take of ESA listed fish.

Potential adverse affects to spring-run chinook salmon from re-operating upstream reservoirs relate primarily to upper Sacramento River in stream flow levels and water temperature control. Releases from Shasta and Trinity reservoirs could be reduced if DW discharges replace a portion of water exports at the Delta pumping plants. Flow reductions which approach or meet minimum in stream flows in the upper Sacramento River are likely to result in the stranding of juvenile fish in side channels with shallow inverts and broad, flat-gradient, near-shore areas. Temperature control operations could be adversely effected by re-operation of upstream reservoirs. Re-scheduling of CVP water deliveries may occur with the availability of additional DW water supplies to the south of Delta water users. The re-scheduling of CVP deliveries could alter seasonal reservoir storage levels and adversely effect temperature control operations designed to protect incubating spring-run chinook eggs and larvae. However, it must be noted that significant re-operation of the CVP or SWP will result in the re-initiation of consultation on these projects with Reclamation and DWR.

VI. CONCLUSION

Based on the best available information and the analysis in this biological opinion, it is NMFS's biological opinion that the proposed construction and operation of the DW water storage project is not likely to jeopardize the continued existence of the spring-run chinook salmon or result in the adverse modification of spring-run chinook salmon critical habitat, nor result in the adverse modification of Central Valley steelhead critical habitat.

INCIDENTAL TAKE STATEMENT

Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. NMFS further defines harm to include any act which actually kills, or injures fish or wildlife and emphasizes that such acts may include significant habitat modification or degradation that significantly impairs essential behavioral patterns, including breeding, spawning, rearing, migration, feeding or sheltering. Incidental take is defined as take of a listed animal species that results from, but is not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7 (b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the proposed action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Section 7(b)(4) of the ESA requires that when a proposed agency action is found to be consistent with section 7(a)(2) of the ESA, and the proposed action may incidentally take individuals of a listed species, NMFS will issue a statement that specifies the impact of any incidental taking of endangered or threatened species. It also states that reasonable and prudent measures, and terms and conditions to implement the measures, be provided that are necessary to minimize such impacts. Under the terms and conditions of section 7(o)(2) and 7(b)(4), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of the Incidental Take Statement.

The measures described below are non-discretionary. They must be implemented by the USACE so that they become binding conditions of any grant or permit issued to Delta Wetlands, as appropriate, for the exemption in section 7(o)(2) to apply. The USACE has a continuing duty to regulate the activity covered in this Incidental Take Statement. If the USACE: (1) fails to assume and implement the terms and conditions of the Incidental Take Statement, and/or (2) fails to require Delta Wetlands to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the USACE and Delta Wetlands must report the progress of the action and its impact on the species to NMFS as specified in this Incidental Take Statement (50 CFR §402.14(i)(3)).

This incidental take statement is applicable to the construction and operations of the Delta Wetlands project as described in the biological assessment submitted on June 21, 1995, the draft environmental impact report/environmental impact statement issued on September 11, 1995, and as modified by the February 21, 1997, letter and proposed operations matrix from the USACE to NMFS.

A. Amount or Extent of Take

The NMFS anticipates that Delta Wetlands (DW) reservoir and habitat island operations will result in take of listed salmonids. This will primarily be in the form of harm to salmonids by impairing essential behavior patterns as a result of reductions in the quality or quantity of their

habitat. In addition, NMFS anticipates that some juveniles may be killed, injured, or harassed during the construction and implementation of this project.

The take of listed salmonids will be difficult to detect because finding a dead or injured salmonid is unlikely as the species occurs in habitat that makes such detection difficult. The impacts of DW operations will result in changes to the quality and quantity of salmonid habitat. These changes in the quantity and quality of salmonid habitat are expected to correspond to injury to or reductions in survival of salmonids by interfering with essential behaviors such as rearing, feeding, migrating, and sheltering. Because the expected impacts to salmonid habitat correspond with these impaired behavior patterns, NMFS is describing the amount or extent of take anticipated from the proposed action in terms of limitations on habitat impacts. The NMFS expects that physical habitat impacts will be: consistent with the project description in terms of location, scope, and compliance with proposed minimization and mitigation measures, compliant with the terms and conditions of this incidental take statement, and within the expected effects of DW operations as described in this Opinion. Adverse effects to, and incidental take of, listed salmonids are primarily expected during the September through May time period.

Anticipated incidental take will be exceeded if DW operations are not in compliance with the project description or the terms and conditions of this incidental take statement, or if effects of DW operations are exceeded or different than the expected effects described in this Opinion.

For example, NMFS anticipates that DW operations will decrease the amount of outflow in the Sacramento/San Joaquin Delta in all months of the year. DW operations could reduce outflows by five percent or more (up to an expected maximum of 25 percent) in ten percent of simulated years. This decrease in outflow is expected to result in reduced feeding and rearing success, or reduced survival of juveniles drawn into the complex maze of waterways in the Delta.

Discharges off of DW islands are expected to increase local channel water temperatures and decrease local dissolved oxygen (DO) levels, particularly during the months of April, May, and September. Increased temperatures and reduced DO levels are expected to result in sub-lethal physiological stress leading to reduced fitness and survival, termination of smoltification, and delays in migration. DW operations are expected to result in DO level changes to no less than 5.0 mg/L and temperature increases of no more than four degrees (or two degrees, depending on ambient water temperatures) in the receiving waters.

The NMFS does not anticipate any incidental take from entrainment during DW diversions or as result of fish screen operations because NMFS anticipates that the screens will be installed to meet or surpass NMFS' screening criteria for anadromous salmonids and shall be maintained properly.

As a result of levee maintenance and installation of boat docks and their operations and ongoing maintenance of project island exterior levees, riparian and SRA habitat are expected to be lost and suppressed and shallow water vegetated habitat will be lost or negatively affected (through creation of predator holding habitat and oil and gas inputs). Changes in instream habitat around DW islands, which is also critical habitat for Central Valley steelhead and Central Valley spring-

run chinook salmon, are expected to reduce rearing and feeding opportunities for juvenile salmonids migrating through the area, resulting in reduced fitness and survival rates.

Operation and maintenance of the DW facilities and the ongoing monitoring program for delta smelt may also incidentally capture listed salmonid juveniles. However, at this time NMFS does not have the information available regarding the specific details of the monitoring program to estimate the amount or extent of incidental take.

Incidental take of listed salmonids at the Central Valley Project (CVP) and State Water Project (SWP) facilities as a result of changes in the flows within the Delta from DW operations is not addressed within this biological opinion and is therefore not covered by this incidental take statement. The CVP and SWP currently operate under a separate ESA Section 7 consultation and should changes in their operations, or exceedance of incidental take levels, occur as a result of DW operations the CVP/SWP consultation shall be reinitiated.

Reasonable and Prudent Measures for Spring-run Chinook Salmon

NMFS believes the following reasonable and prudent measures are necessary and appropriate to minimize the incidental take of spring-run chinook salmon caused by DW.

1. Measures shall be taken to reduce the extent of entrainment and predation during DW diversion operations through the use of fish screens meeting or exceeding NMFS criteria.

2. Measures shall be taken to reduce degradation of Delta habitat during construction, operation, and maintenance activities.

3. Measures shall be taken to reduce impacts to juvenile spring-run chinook salmon from discharge monitoring activities.

4. Measures shall be taken to monitor DW operations and Delta hydrologic conditions.

The USACE is responsible for DW compliance with the following non-discretionary terms and conditions that implement the reasonable and prudent measures described above:

1. Measures shall be taken to reduce the extent of entrainment and predation during DW diversion operations through the use of properly designed fish screens.

Terms and conditions:

a. The USACE shall ensure the final fish screen design and construction schedule is submitted to NMFS Southwest Region for review and acceptance prior to construction. At least 90 percent of the design shall be

submitted to NMFS at least two months prior to the completion of the design process.

b. The USACE shall ensure that a hydraulic monitoring program for evaluating the performance of the fish screens and conformance with NMFS criteria is submitted to NMFS Southwest Region for review at least two months prior to the start of operations.

c. The USACE shall ensure the fish screens are adequately operated and maintained by submitting to NMFS a proposed operations and maintenance plan which includes:

   i. periodic underwater inspections;
   ii. periodic hydraulic measurements; and
   iii. periodic assessments of screen performance - component reliability, component durability, and screen-cleaning system effectiveness.

d. The USACE shall ensure that DW annually submits a log record to NMFS Southwest Region that documents compliance with measures 1-3 above.

2. Measures shall be taken to reduce degradation of Delta habitat during construction, operation, and maintenance activities.

Terms and conditions:

a. Riparian vegetation and/or SRA lost or damaged during construction or maintenance shall be mitigated by adherence to the "Guidelines for Revegetation" in Appendix 3.

b. Levee maintenance and bank protection activities shall adhere to the material guidelines described in Appendix 4.

c. Steel pilings and sheetpile may not be treated with chemical antifouling products.

d. Wood piles, or wood cores within concrete piles, may not be creosote-treated wood or chromated copper arsenate pressure-treated wood.

3. **Measures shall be taken to reduce impacts to juvenile spring-run chinook salmon form discharge monitoring activities.**

Terms and conditions:

a. Captured chinook salmon shall be handled with extreme care and kept in cool local water to the maximum extent possible during the sampling and processing procedures. Artificial slime products or anesthetics may be used to reduce physiological or osmotic stresses. Chinook salmon handled our-of-water for the purpose of recording biological information shall be anesthetized, when necessary, to prevent mortality. Anesthetized fish shall be allowed to recover (e.g. in a recovery bucket) before being released. Fish that are simply counted shall remain in water but do not need an anesthetic. All captured salmonids shall be returned to the water as soon as possible.

b. With gear that capture a mixture of species, chinook salmon shall be removed, processed first, and returned to the water as soon as possible.

c. Identification of the listed juvenile fish authorized to be captured and handled by this permit shall be based on NMFS-approved size criteria until other identification methods are formally approved by NMFS.

d. The following information shall be collected on each fish identified as a spring-run chinook salmon in the field:

   i. location of capture, including near shore habitat type and water stage;
   ii. date and time of capture;
   iii. fork length; and
   iv. fish condition, including abrasions, or other obvious injuries or scale losses,

   This information shall be submitted to NMFS as a part of the weekly reports described below.

e. Any spring-run chinook salmon mortalities shall be placed in labeled whirl-pak bags and promptly frozen. Labels shall include the date/location of capture and the fork length of the fish. NMFS shall be notified as soon as soon as possible of any spring-run chinook salmon mortalities.

f. An annual report of DW operations shall include:

   i. a description of the total number of spring-run chinook salmon taken, the manner of take, and the dates and locations of take, the

condition of spring-run chinook salmon taken, the disposition of spring-run chinook salmon in the event of mortality, and a brief narrative of the circumstances surrounding injuries or mortalities; and

ii. this report shall be submitted to the addresses given below.

4. Measures shall be taken to monitor DW operations and Delta hydrologic conditions.

Terms and conditions:

a. The USACE shall ensure that DW develops a comprehensive monitoring plan designed to collect the hydrologic and project operational information described below in i-vi. This monitoring plan shall be submitted to NMFS Southwest Region for review and approval prior to its implementation. The results of this monitoring program will be used to determine if the DW project is affecting spring-run chinook salmon to an extent not previously considered. The USACE, in coordination with DW, shall provide weekly monitoring reports of diversions and discharges to NMFS. These reports shall include the following information:

i. daily diversions at each intake siphon station on the reservoir and habitat islands;
ii. daily discharges at each discharge station on the reservoir and habitat islands;
iii. daily amount of DW discharged water exported at the CVP and SWP pumping plants;
iv. daily average QWEST;
v. net flow in cfs in the Old and Middle Rivers north of the CVP/SWP pumping plants; and
vi. daily receiving water temperatures and dissolved oxygen conditions and resultant changes to those conditions from DW discharges.

b. The USACE, in coordination with DW, shall summarize the above weekly reports into an annual report of the DW project operations and Delta hydrological conditions for the previous water year (July 1-June 30) for submission to NMFS by September 30 of each year.

c. All weekly and annual reports shall be submitted by mail or fax to:

i. Regional Administrator
Southwest Region, NMFS
501 West Ocean Boulevard, Suite 4200
Long Beach, California, 90802
Fax: (562) 980-4027

ii. Mr. Mike Aceituno
NMFS, Sacramento Field Office
650 Capitol Mall, Suite 6070
Sacramento, California, 95814
Fax: (916) 498-6697

VII. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. These "conservation recommendations" include discretionary measures that the USACE can take to minimize or avoid adverse effects of a proposed action on a listed species or critical habitat or regarding the development of information. In addition to the terms and conditions of the Incidental Take Statement, NMFS provides the following conservation recommendations that would reduce or avoid adverse impacts on the Central Valley spring-run chinook salmon ESU:

5. The USACE should encourage the use of levee maintenance designs that would increase and enhance the quantity and quality of riparian and shaded riverine aquatic habitat.

6. The USACE should support, through funding and other means, studies which evaluate juvenile salmonid rearing and migratory behavior in the Sacramento/San Joaquin Delta, including the effects of various water management operations on juvenile survival and behavior.

VIII. Reinitiation of Consultation

Reinitiation of formal consultation is required if there is discretionary Federal involvement or control over the action and if (1) the amount of extent of taking specified in any incidental take statement is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the actions subsequently modified in a manner that causes an effect to the listed species that was not considered in the biological opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, formal consultation shall be reinitiated immediately.

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Attachment 1.

Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA)

ESSENTIAL FISH HABITAT CONSERVATION RECOMMENDATIONS[4]

The Pacific Fisheries Management Council has recommended an EFH designation for the Pacific salmon fishery, and is awaiting approval by the Secretary of Commerce. However, if approval occurs before this project has been finalized, the U.S. Army Corps of Engineers (USACE), in cooperation with Delta Wetlands (DW), must provide a detailed response in writing describing the measures proposed by Delta Wetlands for avoiding, mitigating, or offsetting the impacts of the project on EFH.

I. IDENTIFICATION OF ESSENTIAL FISH HABITAT

The geographic extent of freshwater essential fish habitat (EFH) for the Pacific salmon fishery is proposed as waters currently or historically accessible to salmon within specific U.S. Geological Survey hydrologic units (Pacific Fisheries Management Council 1999).

EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purpose of interpreting the definition of essential fish habitat, "waters" includes aquatic areas and their associated physical , chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means habitat required to support a sustainable fishery and a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle. For the Sacramento-San Joaquin Delta, the aquatic areas that may be identified as EFH for salmon are within the hydrologic unit map numbered 18040003 (titled San Joaquin Delta).

Historically, the Sacramento-San Joaquin Delta, has served as a migratory route for immigrating adult winter, spring, and fall-run chinook salmon (*Oncorhynchus tshawytscha*) to their spawning habitat, and for rearing and emigration of juveniles returning to the ocean (Yoshiyama et al. 1996). Within the Central Valley of California, populations of winter and spring-run chinook salmon have declined significantly as a result of habitat degradation due to dams, water diversions, and placer mining, as well as past and present land-use practices. The fall-run has been reduced, however to a lesser extent than the winter-run and spring-runs (Myers 1998). Recent estimates find that fall-run chinook have declined between 85 percent to 90 percent (Rich and Loudermilk 1991; USFWS 1995) of the population levels which existed in the 1940's. Fall-run chinook spawning population estimates from the Stanislaus, Tuolumne and Merced Rivers from 1974 to 1991 show both rising and descending trends lasting for several years (Kano 1996, 1998). Factors limiting salmon populations include low instream flows, high water temperature, reversed flows in the Delta (drawing juveniles into large diversion pumps), loss of fish into unscreened agricultural diversion, predation (especially by warm-water fish species), and lack of

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[4]The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) set forth new mandates for the National Marine Fisheries Service (NMFS) and federal action agencies to protect important marine and anadromous fish habitat. Federal action agencies which fund, permit, or carry out activities that may adversely impact EFH are required to consult with NMFS regarding potential adverse effects of their actions on EFH, and respond in writing to NMFS "EFH Conservation Recommendations."

rearing habitat (Kondolf et al., 1996a, 1996b). In addition to direct losses caused by the entrainment or entrapment of fish at diversions, withdrawals of water affect both the total volume of water available to salmon and their prey, as well as the seasonal distribution of flows. Consequently, migration may be altered, changes to sediment and large woody debris transport and storage, altered flow and temperature regimes, pollution, and water level fluctuations may result (Dettman et al. 1987; CACSST 1988).

LIFE HISTORY AND HABITAT REQUIREMENTS

General life history information for chinook salmon is summarized below. Further detailed information on chinook salmon ESUs are available in the NMFS status review of chinook salmon from Washington, Idaho, Oregon, and California (Myers et al. 1998), and the NMFS proposed rule for listing several ESUs of chinook salmon (NMFS 1998).

Central Valley fall-run chinook enter the Sacramento and San Joaquin Rivers from July through April and spawn from October through December (USFWS 1998) with spawning occurring from October through December. Peak spawning occurs in October and November (Reynolds et al. 1993). Chinook salmon spawning generally occurs in swift, relatively shallow riffles or along the edges of fast runs at depths greater than 6 inches, usually 1-3 feet to 10-15 feet. Preferred spawning substrate is clean loose gravel, Gravels are unsuitable for spawning when cemented with clay or fines, or when sediments settle out onto redds reducing intergravel percolation (NMFS 1997).

Egg incubation occurs from October through March, and juvenile rearing and smolt emigration occurs from January through June (Reynolds et al. 1993). Shortly after emergence from their gravel nests, most fry disperse downstream towards the Delta and estuary (Kjelson et al. 1982). The remainder of fry hide in the gravel or station in calm, shallow waters with bank cover such as tree roots, logs, and submerged or overhead vegetation. These juveniles feed and grow from January through mid-May, and emigrate to the Delta and estuary from mid-March through mid-June (Lister and Genoe 1970). As they grow, the juveniles associate with coarser substrates along the stream margin or farther from shore (Healey 1991). Along the emigration route, submerged and overhead cover in the form of rocks, submerged aquatic vegetation, logs, riparian vegetation, and undercut banks provide food, shade and protect juveniles and smolts from predation. These smolts generally spend a very short time in the Delta and estuary before entry into the ocean.

In contrast, the majority of fry carried downstream soon after emergence are believed to reside in the Delta and estuary for several months before entering the ocean (Healey 1980, 1982; Kjelson et al. 1982). Principal foods of chinook while rearing in freshwater and estuarine environments are larval and adult insects and zooplankton such as *Daphnia,* flys, gnats, mosquitoes or copepods (Kjelson et al. 1982), stonefly nymphs or beetle larvae (Chapman and Quistdorff 1938) as well as other estuarine and freshwater invertebrates. Whether entering the Delta or estuary as a fry or juvenile, fall-run chinook depend on passage through the Sacramento-San Joaquin Delta for access to the ocean.

II. PROPOSED ACTION.

The proposed action is described in Part II of the preceding Biological Opinion for the threatened Central Valley spring-run chinook salmon ESU and its critical habitat, as well as critical habitat for the threatened Central Valley steelhead ESU.

III. EFFECTS OF THE PROJECT ACTION

The Sacramento-San Joaquin Delta is of vital importance to the migration of adult and juvenile chinook salmon. In addition, the majority of the fall-run chinook salmon rely on the Delta and estuary for rearing that will prepare them for entry and survival in the ocean. As such, it functions as a portion of the habitat necessary to support a sustainable population. The presence and operation of DW's reservoir and habitat islands can interrupt the EFH habitat functions by reducing the quantity and quality of rearing, feeding, migration and sheltering habitat.

It is anticipated that DW operations will alter the flows in the Sacramento-San Joaquin Delta throughout the year resulting in reduced feeding and rearing success and reverse flows that impede migration. Discharged water will likely affect water quality by increasing temperatures and pollutants, and decreasing dissolved oxygen levels. Riparian and Shaded Riverine Aquatic (SRA) habitats are expected to be lost as a result of levee maintenance, maintenance and construction of DW facilities (pump stations), and construction of boat docks. These actions are expected to reduce rearing and feeding opportunities for juvenile fall-run chinook salmon by removing or otherwise destroying riparian and SRA habitat, increasing pollution input from boats, and creating holding habitat for predators. Kondolf et. al. (1996a) notes that warm-water predators tend to concentrate around artificial structures such as irrigation diversion structures. Lastly, the monitoring of delta smelt may result in the incidental capture of fall-run chinook salmon.

IV. CONCLUSION

Upon review of the effects of the DW reservoir island project, NMFS believes that the operation of the Delta Wetlands project imposes an adverse affect on the potential EFH of fall-run chinook in the project area of the Sacramento-San Joaquin Delta.

V. EFH CONSERVATION RECOMMENDATIONS

NMFS recommends that Reasonable and Prudent Measures Numbers 1, 2, 3, and 4, and their respective Terms and Conditions listed in the Incidental Take Statement prepared for the Central Valley spring-run chinook salmon ESU in the preceding Biological Opinion be adopted as EFH Conservation Recommendations. In addition, four additional EFH Conservation Recommendations are provided below. These recommendations are provided as advisory measures.

7. The USACE and DW should report annually to NMFS on the volumes of water diverted onto each of the reservoir and habitat islands, as well as the volumes of water discharged back into the Delta.

8. DW should curtail all diversion if any fish screen, or part thereof, is damaged or removed for maintenance or repair and would allow diversion of unscreened water.

9. The USACE and DW should monitor the construction area and implement adequate control measures to avoid or minimize sediment, turbidity and pollutant input into the Delta during construction and maintenance operations.

10. The USACE and DW should report annually on the progress and success of the restoration of the 200 acres of shallow water habitat, and its benefits to fall-run chinook salmon.

VI. U.S. ARMY CORPS OF ENGINEER'S STATUTORY REQUIREMENTS

The Magnuson-Stevens Act and Federal regulations (50 CFR § 600.920) to implement the EFH provisions of the MSFCMA require federal action agencies to provide a written response to EFH Conservation Recommendations within 30 days of its receipt. Because the EFH designations for Pacific salmon have yet to be approved, this regulation does not apply until approved by the Secretary of Commerce, at which time the 30 day period will commence. It is anticipated that the Secretary will approve this ESA by September 27, 2000. A preliminary response is acceptable if final action cannot be completed within 30 days. Your final response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity. If your response is inconsistent with our EFH Conservation Recommendations, the USACE must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

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Appendix 1. Proposed mitigation package for impacts to listed species from the proposed operations of the DW project.

This narrative reflects final operations criteria for the Delta Wetlands (DW) project that would take the place of the operations criteria previously proposed by Jones & Stokes Associates (JSA) on March 1, 1996. These operations criteria are intended to ensure that the DW project operations do not jeopardize the continued existence of delta smelt, Sacramento splittail, winter-run chinook salmon, spring-run chinook salmon, or steelhead trout. DW expects that non-listed species will also benefit from these criteria and such criteria will replace the related mitigation measures for fishery impacts proposed in the context of the CEQA/NEPA process.

Under these operations criteria, DW will be consistent with, and in many instances, exceed the conditions set forth in the State Water Resources Control Board's (SWRCB) 1995 Water Quality Control Plan for the Bay-Delta estuary. These revised operations criteria set forth multi-layered diversion and discharge parameters. In the instance where two or more conditions apply, the condition that is more restrictive on DW operations will control.

Additional restrictions apply if the Fall Mid-Water Trawl (FMWT) index shows a significant decline in delta smelt abundance. The FMWT Index refers to the most current four month (September-December) FMWT Index in place at the time of the intended diversion. A diversion prior to January can utilize either the previous year's FMWT Index or the partial FMWT Index for the months available, whichever is greater. Any changes in the FMWT Index calculation methodology will be adjusted so that the FMWT Index values applied herein can continue to be the standard for DW operations criteria.

A delta smelt FMWT Index measurement of less than 84 (FMWT<84) is new information under the reinitiation regulations (50 CFR § 402.16) and may require reinitiation of the United States Fish and Wildlife Service (USFWS) biological opinion. [#266, 45][5]

The following text represents the final language for replacement of Term I of the USFWS draft biological opinion: [#1]

> DW will not enter into any contractual agreement(s) which would provide for the export of more than 250,000 AF of DW water on a yearly (calendar year) basis. This provides for, but is not limited to, the following types of transfers: a c-user, short-term, opportunistic water transfer; a long-term water transfer; or any other such agreement, or contract for sale or transfer which is consistent with the March 6, 1995 biological opinion for the CVP/SWP, the SWRCB's 1995 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (1995 WQCP), and the improved environmental baseline established under the March 6, 1995, CVP/SWP Section 7 consultation performed in conjunction with implementation of the *Principles for Agreement on Bay-Delta Standards Between the State of California and the Federal Government* (Bay-Delta Agreement). If such agreement(s) were determined to result in an adverse effect to delta smelt, delta smelt critical habitat or the Sacramento splittail in a manner or to an extent not previously identified, the contractual agreement(s) would be subject to some level of further environmental review.

DIVERSION MEASURES

DW shall limit diversions to the four project islands as set forth in the following measures:

5. In the period from September through November, DW shall not undertake its initial diversion to storage for the current water year until X2 is located at or downstream of Chipps Island. If DW's initial diversion to storage has not taken place by November 30, 1996, DW shall not undertake its

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[5] The number(s) in brackets are provided as a reference to the DW ESA Matrix which summarizes the final operations criteria as compared to the March 1, 1996 JSA proposed terms.

initial diversion to storage for the current water year until X2 is located at or downstream of Chipps Island for a period of ten (10) consecutive days. After the initial X2 condition is met, diversions shall be limited to a combined maximum rate of 5,500 cfs for five (5) consecutive days. Information documenting achievement of the X2 condition and resultant operational changes shall be submitted to the USFWS, NMFS, and CDFG within 24 hours of implementation of operational changes. [#2, 3, 4]

The location of X2 shall be defined as the average daily location of a surface water salinity of 2.64 EC, determined by interpolating the average daily surface EC measurements at existing Bay-Delta monitoring stations. Should the traditional X2 methodology be replaced, superseded, or become otherwise unavailable, DW shall follow whatever equivalent practice is developed, subject to approval of the resources agencies and notice to the responsible agencies.

6. In the period from September through March, DW shall not divert water to storage when X2 is located upstream (east) of the Collinsville salinity gauge. When the delta smelt FMWT Index is less than 239 (FMWT<239), DW shall not divert water to storage when X2 is located upstream of a point 1.4 kilometers (km) west of the Collinsville salinity gauge. [#5, 6, 7, 19]

7. In the period from October through March, DW shall not divert water to storage if the effect of DW diversions would cause an upstream shift in the X2 location in excess of 2.5 km. The resultant shift in X2 shall be determined by a comparison of the modeled estimates of the X2 location outflow, with and without the DW project, using a mathematical model, e.g., Kimmerer and Monismith equation. [#8, 9]

8. In the period from April through May, DW shall not divert water to storage. If the delta smelt FMWT index is less than 239 (FMWT<239), DW shall not divert water for storage from February 15 through June 30. [#10, 20]

9. DW diversions to storage shall be limited to the following percentage of available surplus water as derived pursuant to the 1995 WQCP (e.g., E/I ratio, outflow). [#13]

Table 1. Surplus Availability

Month	FMWT>239	FMWT<239
October	90%	90%
November	90%	90%
December	90%	90%
January	90%	90%
February 1-14	75%	75%
February 15-28	75%	NA
March	50%	NA
April	NA	NA
May	NA	NA
June	50%	NA
July	75%	75%
August	90%	90%
September	90%	90%

10. DW diversions to storage shall not exceed a percentage of the previous day's net Delta outflow rate (cfs), as set forth in the following table: [#11, 23]

Table 2. Outflow Diversion Limit

Month	Percent Outflow[6]	
	FMWT>239	FMWT<239
October	25%	25%
November	25%	25%
December	25%	25%
January	15%	15%
February 1-14	15%	15%
February 15-28	15%	NA
March	15%	NA
April	NA	NA
May	NA	NA
June	25%	NA
July	25%	25%
August	25%	25%
September	25%	25%

11. In the period from December through March, DW diversions to storage shall not exceed the percentage of the previous day's San Joaquin River (SJR) inflow rate (cfs) for the maximum number of days, as set forth in the following table: [#12, 24]

Table 3. San Joaquin Diversion Limit

Month	Percent SJR Inflow[7]	
	FMWT>239	FMWT<239
Application[1]	15 days	30 days
December	125%	125%
January	125%	100%
February 1-14	125%	50%
February 15-28	125%	NA
March	50%	NA

12. DW shall implement a monitoring program to minimize or avoid adverse impacts of DW diversions to storage, as set forth below: [#15, 16, 21, 22]

    a. DW shall implement a monitoring program in accordance with the attached "Delta Wetlands Fish Monitoring Program."
    b. DW shall provide daily in-channel monitoring from December through August during all diversions to storage, except as provided below.
    c. DW shall provide daily on-island monitoring from January through August during all diversions to storage, except as provided below.

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[6] The percent of Delta outflow is calculated without consideration of DW diversions; therefore, the calculation could use the previous day's actual Delta outflow added to the previous day's DW diversions to yield an outflow value that would not include DW operations.

[7] The application of the SJR diversion limit is subject to a specific election on the part of the responsible fishery agencies for a maximum number of days, as specified above. The election to invoke the SJR diversion limit shall be based upon available monitoring data (e.g., project specific monitoring, FMWT data).

d. Monitoring shall not be required at a diversion station if the total diversion rate at the station is less than 50 cfs and the maximum fish screen approach velocity is less than 0.08 fps (e.g., topping-off)

e. DW shall reduce the diversions at a diversion station to 50% of the previous day's diversion rate during the presence of delta smelt. Should delta smelt be detected on the first day of diversions to storage, the diversion rate shall be immediately reduced by 50%. This reduced diversion rate will remain in place until the monitoring program no longer detects the presence of delta smelt at the diversion station. For the purpose of this mitigation measure, delta smelt presence is defined as a two-day running average in excess of one (1) delta smelt per day at any reservoir diversion station. The definition of presence may be revisited from time to time as new information or monitoring techniques become available.

9. During periods when the Delta Cross Channel (DCC) gates are closed for fisheries protection purposes, between November 1 and January 31, and the inflow into the Delta is less than or equal to 30,000 cfs, DW shall restrict diversions onto the reservoir islands to a combined instantaneous maximum of 3,000 cfs. When the DCC gates are closed for fishery protection purposes and the inflow into the Delta is between 30,000 and 50,000 cfs, DW shall restrict diversions onto the reservoir islands to a combined instantaneous maximum of 4,000 cfs. At Delta inflows greater than 50,000 cfs, DW diversions shall not be restricted by the closure of the DCC for fishery protection purposes. For purposes of this provision, Delta inflow is defined in accordance with the 1995 WQCP. [#17]

10. Nothing in measures 1 through 9 above shall limit DW from diverting water onto Bacon Island and Webb Tract from June through October in order to offset actual reservoir losses of water stored on those islands, hereafter referred to as "topping-off" reservoirs. Daily topping-off diversions shall be subject to the following conditions: [#18, 25]

a. Topping-off diversions shall not exceed the maximum diversion rate (cfs) and maximum monthly quantity (TAF) listed below:

Table 3. Maximum Topping-Off Diversion Rates

Month	June	July	August	September	October
Maximum diversion rate (cfs)	215	270	200	100	33
Maximum monthly quantity (TAF)	13	16	12	6	2

b. Topping-off diversions shall occur through screened diversions with approach velocities less than 0.10 fps.

c. A mechanism acceptable to USFWS, NMFS, and CDFG shall be devised and used by DW to document actual reservoir losses.

d. The maximum topping-off diversion rates shown above shall be further limited by diversions onto the habitat islands. The maximum topping-off diversion rate and quantity shall be reduced by an amount equal to the habitat island diversions during the same period.

DISCHARGE MEASURES

DW shall limit discharges from the four project islands as set forth in the following measures:

1. In the period from April through June, DW shall limit discharges for export or rediversion from Bacon Island to one-half (50%) of the San Joaquin inflow measured at Vernalis. [#34]

2. In the period from January through June, DW shall not discharge for export or rediversion from Webb Tract. [#33]

3. DW shall not discharge for export or rediversion any water from the habitat islands. [#41]

4. In the period from February through July, DW discharges for export shall be limited to the following percentage of the available unused export capacity at the CVP and SWP facilities as derived pursuant to the 1995 WQCP. [#35, 36]

Table 5. Export Availability

Month	Bacon Island	Webb Tract
February	75%	NA
March	50%	NA
April	50%	NA
May	50%	NA
June	50%	NA
July	75%	75%

5. DW shall provide a quantity of "environmental water" for release as additional Delta outflow, as set forth in the following terms and conditions: [#38, 42]

   a. DW shall provide a quantity of environmental water equal to 10% of all discharges for export that occur in the period from December through June. If the delta smelt FMWT Index is less than 239 (FMWT<239), this environmental water percentage shall be increased to 20% of all discharges for export that occur in te period from December through June.
   b. Environmental water shall be released between February and June of the same water year as the discharge for export that generated the water and may not be banked for future use in subsequent water years.
   c. Habitat island discharges may be credited toward the environmental water quantities required above, if;

      i. habitat island discharges occur between February and June'
      ii. habitat islands discharges credits are limited to the net flow quantity (e.g., habitat discharge minus habitat diversion);
      iii. habitat island discharges occur during a period of time when 75% of the spacial distribution of the delta smelt population is located downstream of the discharge location, where the determination of spacial distribution is based on the most recent distribution data available (e.g., IEP);
      iv. the habitat island discharge rate does not vary on a daily basis more than 1% of the average gross flow rate in the adjacent channel, either upstream or downstream, when delta smelt are spawning in the area;
      v. DW makes a best effort to minimize fluctuations in daily discharge rates; and
      vi. the habitat island discharges are consistent with the HMP.

   d. Environmental water, less habitat island discharge credits, shall be discharged at the discretion of USFWS, NMFS and CDFG to maximize fishery benefits. Coordination of these discharges shall be performed by the CDFG Bay-Delta office.

6. DW shall implement a monitoring program to minimize or avoid adverse impacts of DW discharges for export, as set forth below: [#39, 40, 43, 44]

   a. DW shall implement a monitoring program in accordance with the "Draft Proposed Delta Wetlands Fish Monitoring Program."

b. DW shall provide daily in-channel monitoring from April through August during all discharges for export, except as provided below.
c. Monitoring shall not be required if the total discharge for export rate is less than 30 cfs.
d. DW shall reduce the discharge for export rate to 50% of the previous day's diversion rate during the presence of delta smelt. Should delta smelt be detected on the first day of discharges for export, the discharge rate shall be immediately reduced to 50%. This reduced diversion rate will remain in place until the monitoring program no longer detects a presence of delta smelt at the in-channel sampling sites. For the purpose of this mitigation measure, delta smelt presence is defined as a two-day running average in excess of one (1) delta smelt per day at the Old and Middle River sampling sites. The definition of presence may be revisited from time to time as new information or monitoring techniques become available.
e. DW shall provide for the monitoring either by contributing financial support commensurate with the proportionate share of DW exports to the Bay/Delta monitoring programs, or when no other monitoring is being conducted at appropriate sites, DW shall provide for direct monitoring in river channels as described above.

OTHER MEASURES

1. Fish Screen Design: [#49]

The DW fish screens will be generally consistent with the design presented in the DEIR/EIS except that DW shall maintain a 0.2 fps approach velocity for diversions. Final design elements and installation guidelines will be subject to approval by te responsible agencies with concurrence by the resource agencies. Final design, including a monitoring program to evaluate the performance criteria, will be submitted for approval at least 90 days prior to commencing operations.

2. Rearing and Spawning Habitat: [#50, 51]

Prior to construction, DW will secure a perpetual conservation easement (easement) for 200 acres of shallow-water aquatic habitat not currently protected by easement or covenant. The easement shall fully protect in perpetuity the shallow-water aquatic habitat. A management plan for the easement area shall be developed for the habitat covered by the easement, and shall be incorporated as an exhibit to the easement.

Additionally, DW shall provide to the USFWS documentation demonstrating adequate financing for the perpetual management of the habitat protected by the easement, consistent with the terms of this biological opinion and the management plan including;

a. adequate funds for the management of habitat protected in perpetuity by the conservation easement has been transferred to an appropriate third-party;
b. the third-party has accepted the funds; and
c. such funds have been deposited in an interest-bearing account intended for the sole purpose of carrying out the purposes of this easement.

The easement (along with a title report for the easement area) and management plan shall be approved by the USFWS prior to recordation. After approval, the easement and management plan shall be recorded in the appropriate County Recorders Office(s). A true copy of the recorded easement shall be provided to the USFWS within 30 days after recordation.

3. Boat Wake Erosion: [#53]

   DW shall contribute $100.00 per year for each net additional berth beyond pre-project conditions added to any of the four project islands. These funds shall be in January 1996 dollars and shall be adjusted annually for inflation.

4. Aquatic Habitat: [#54]

   The actual impact to aquatic habitat acreage for construction and operation of siphon and pumping facilities and waterside boat docks shall be verified prior to construction and mitigation shall take place on a 3:1 basis.

5. Temperature Limits: [#55]

   DW shall implement a temperature program to minimize or avoid adverse impacts of DW discharges for export, as set forth below:

   a. DW shall not discharge reservoir water for export if the temperature differential between the discharge and the adjacent channel temperature is greater than or equal to 20°F.
   b. If the natural receiving water temperature of the adjacent channel is greater than or equal to 55°F and less than 66°F, DW discharges for export shall not increase the channel temperature by more than 4°F.
   c. If the natural receiving water temperature of the adjacent channel is greater than or equal to 66°F and less than 77°F, DW discharges for export shall not cause an increase of more than 2°F.
   d. If the natural receiving water temperature of the adjacent channel is greater than or equal to 77°F, DW discharges for export shall not cause an increase of more than 1°F.
   e. DW shall develop temperature monitoring and implementation plans to ensure that the project does not adversely impact the channel temperature levels as described above. The monitoring plan shall include reservoir and channel temperature monitoring. The monitoring and implementation plans shall be completed after the project is permitted, but at least 90 days prior to project operations. The plans shall be submitted to the responsible agencies for approval with concurrence of the resource agencies.

6. DO Limits: [#56]

   DW shall implement a dissolved oxygen (DO) program to minimize or avoid adverse impacts of DW discharges for export, as set forth below:

   a. DW shall not discharge reservoir water for export if the discharge DO level is less than 6.0 mg/l without authorization from the resources agencies and notice to the responsible agencies.
   b. DW shall not discharge reservoir water for export if the discharge would cause channel water DO levels to fall below 5.0 mg/l.
   c. DW shall develop DO monitoring and implementation plans to ensure that the project does not adversely impact the channel DO levels as described above. The monitoring plan shall include reservoir and channel DO monitoring. The monitoring and implementation plans shall be completed after the project is permitted, but at least 90 days prior to project operations. The plans shall be submitted to the responsible agencies for approval with the concurrence of the resource agencies.

7. Incidental Entrainment Compensation: [#57]

   Certain life stages of key fish species may not be effectively screened during periods of diversions for storage. DW will, therefore, sample DW diversions during the periods specified below and compensate for losses to selected target fish. DW diversions onto the reservoir islands will be sampled

for egg, larval, and juvenile life stages of the selected target fish. Those losses will be mitigated using a formula which ties measured losses with mitigation as specified below.

This provision covers entrainment of non-listed species, as well as delta smelt and splittail. Coverage of non-listed species is intended as a CEQA/NEPA mitigation measure and is only included here for ease of understanding.

Should on-island monitoring detect the presence of eggs, larvae, or juveniles during the months specified in the incidental entrainment monitoring guidelines, DW shall provide monetary compensation for incidental entrainment, as set forth in the following tables:

Table 6. Incidental Entrainment Monitoring Guidelines

Species and Life Stage	January	February	March	June	July	August
STRIPED BASS						
Larvae and Juveniles				✓	✓	✓
AMERICAN SHAD						
Larvae and Juveniles				✓	✓	✓
DELTA SMELT						
Larvae	✓	✓	✓	✓	✓	
Juveniles		✓	✓	✓	✓	✓
SPLITTAIL						
Larvae	✓	✓	✓	✓	✓	✓
Juveniles		✓	✓	✓	✓	✓
LONGFIN SMELT						
Eggs and Larvae	✓	✓	✓			
Juveniles	✓	✓	✓	✓	✓	✓

Table 7. Incidental Entrainment Compensation

Measured Density	Mitigation/TAF
10-999 eggs, larvae, and juveniles/AF	$500.00
1,000-5,000 eggs, larvae, and juveniles/AF	$750.00
>5,000 eggs, larvae, and juveniles/AF	$1,000.00

Should DW be unable to perform on-island monitoring, the maximum mitigation compensation will be assumed, unless waved or modified by the responsible agencies, with concurrence of the resource agencies. Funds are in January 1996 dollars and shall be adjusted annually for inflation. Monetary reimbursement shall be deposited into a mitigation fund on a semi-annual basis. The use of the mitigation funds shall be at the discretion of the resource agencies (e.g., CDFG Bay-Delta office) but shall be used to the fullest extent possible to plan and implement actions that improve habitat for the target species in the Estuary.

8. Construction Period: [#60]

All construction activities taking place in the tidal waters of the adjacent channels or impacting a tidal water habitat shall occur between June and November.

Appendix 2. Baseline and SW Operations Conditions
September through May
70 Year Simulation (JSA 1996)

		CVP/SWP Export Levels	QWEST	Delta Outflow	Old and Middle Rivers Flow
September	Baseline	7,147	-540	4,951	-6,660
	DW	7,411	-800	4,691	-6,924
October	Baseline	8,695	-456	7,578	-9,300
	DW	9,019	-1,062	6,972	-9,355
November	Baseline	9,107	-3,212	11,287	-7,597
	DW	9,127	-3,902	10,597	-7,616
December	Baseline	10,138	-1,848	22,257	-8,216
	DW	10,229	-2,241	21,864	-8,307
January	Baseline	11,025	570	34,981	-8,176
	DW	11,226	0.1	34,410	-8,197
February	Baseline	10,487	4,011	47,215	-6,861
	DW	10,568	3,542	46,746	-6,950
March	Baseline	9,420	3,450	38,703	-6,252
	DW	9,456	3,423	38,676	-6,288
April	Baseline	6,666	3,614	25,665	-6,219
	DW	6,753	3,655	25,707	-6,306
May	Baseline	6,191	1,914	17,458	-6,418
	DW	6,314	1,950	17,494	-6,540

Appendix 3. Guidelines for Revegetation of Woody Riparian and Shaded Riverine Aquatic Habitat

NMFS anticipates that adherence to these guidelines will result in 'no net loss' of riparian vegetation or Shaded Riverine Aquatic (SRA) habitat within the project area.

1. All remaining, natural woody riparian or shaded riverine aquatic (SRA) habitat shall be avoided or preserved to the maximum extent practicable.

2. Re-planting ratios for woody riparian and SRA shall replace lost habitat at a ratio of 3 to 1 (3:1).

3. Exposed soil shall be seeded with an appropriate assemblage of native grasses to aid in the stabilization of levee soil to minimize erosion.

4. Species chosen for replanting should reflect native species lost during the permitted activity or native species usually found in the riparian ans SRA zones of the project location.

5. Plantings should be done during the optimal season for the species being planting. Therefore, completion of the entire mitigation plan may not occur at the same time as the permitted activity.

6. Maintenance plans for revegetated sites should continue for at least three growing seasons to allow the vegetation to establish and insure that they are successful.

7. Remediation plans should be prepared in the event of a planting failure.

Appendix 4. Material Guidelines for Levee Maintenance and Bank Stabilization Projects

These guidelines should be applied to all bank stabilization and levee maintenance projects.

8. No petroleum products such as asphalt may be used.

9. Concrete or other similar rubble shall be free of trash or reinforcement steel.

10. If anchoring and stabilizing fabrics (geotextiles, armorflex, etc.) Are used, they shall be slit in appropriate locations to allow for plant root growth.

11. No fill material other than clean, silt-free gravel or river rock shall be allowed to enter the live stream.

12. When possible, hard points, fish groins, or tethered trees should be incorporated into the levee or bank protection design.

Protest Dismissal Agreement Between Delta Wetlands Properties and East Bay Municipal Utility District

Resumed Water Rights Hearing for the Delta Wetlands Project

Before The

State Water Resources Control Board

(October 2000)

East Bay Municipal Utility District

PROTEST DISMISSAL AGREEMENT BETWEEN DELTA WETLANDS PROPERTIES AND EAST BAY MUNICIPAL UTILITY DISTRICT

EBMUD Exhibit No. 6

PROTEST DISMISSAL AGREEMENT BETWEEN DELTA WETLANDS PROPERTIES AND EAST BAY MUNICIPAL UTILITY DISTRICT

This Protest Dismissal Agreement is entered into and effective this 15th day of Sept, 2000, by and among Delta Wetlands Properties ("Delta Wetlands") and the East Bay Municipal Utility District ("EBMUD").

RECITALS

WHEREAS, Delta Wetlands has applied to the State Water Resources Control Board to appropriate water pursuant to Application Nos. 29062, 29066, 30268 and 30270 and petitions for change thereto ("Delta Wetlands Applications");

WHEREAS, EBMUD filed with the State Water Resources Control Board a protest of the Delta Wetlands Applications, said protest based upon (a) fishery and (b) levee and Mokelumne Aqueduct security grounds;

WHEREAS, the State Water Resources Control Board has conducted a hearing on the Delta Wetlands Applications and will resume the hearing on October 10, 2000;

WHEREAS, EBMUD has appeared as a protestant and an interested party in the hearing on the Delta Wetlands Applications;

WHEREAS, Delta Wetlands and EBMUD desire to resolve issues between them regarding the Delta Wetlands Applications;

WHEREAS, EBMUD has implemented and continues to implement a comprehensive program to protect and enhance the lower Mokelumne River anadromous fishery; to further protect that fishery, EBMUD and Delta Wetlands wish to ensure that Delta Wetlands implements measures to minimize potential Delta Wetlands Project impacts upon that fishery;

WHEREAS, Delta Wetlands wishes to ensure the security of its Bacon Island and Webb Tract reservoir island levees and seepage control systems;

WHEREAS, EBMUD owns and operates the Mokelumne Aqueducts, which convey water across the Delta to supply EBMUD's East San Francisco Bay service area with approximately 95% of its water;

WHEREAS, Bacon Island, a proposed reservoir island of the Delta Wetlands Project, is located just north of and adjacent to the Mokelumne Aqueducts as they pass through the Delta;

WHEREAS, EBMUD wishes to ensure that the Bacon Island levees are secure and do not fail and that the levees on adjacent islands around Bacon Island are not damaged by the Project, either of which EBMUD contends could damage or destroy the Mokelumne Aqueducts; and

WHEREAS, EBMUD wishes to ensure that all seepage from Delta Wetlands' reservoir operations on Bacon Island to neighboring islands is controlled to prevent damage to the Mokelumne Aqueducts;

NOW, THEREFORE, the parties agree as follows:

1. Delta Wetlands and EBMUD agree to present Attachment A, Fisheries Terms and Conditions, Attachment B, Geotechnical Terms and Conditions, and Attachment C, Delta Wetlands Seepage Control Plan, to the State Water Resources Control Board and to support inclusion of those terms and conditions in any and all permits or licenses issued by the State Water Resources Control Board for the Delta Wetlands Project, including any permits or licenses issued pursuant to Application Nos. 29062, 29066, 30268 and 30270.

2. EBMUD agrees not to oppose the issuance of water right permits or licenses to Delta Wetlands pursuant to the Delta Wetlands Applications and agrees to withdraw its protest on the condition that the terms and conditions contained herein as Attachments A, B and C are included in such permits and licenses where applicable.

3. Whether or not the State Water Resources Control Board includes the terms and conditions contained in Attachments A, B and C, Delta Wetlands and its successors shall be subject to and comply with the terms, conditions and requirements of Attachments A, B and C, including the procedures regarding the Design Review Board and the Monitoring and Action Board.

4. At the resumed water rights hearing on its applications, Delta Wetlands will offer this Agreement into evidence as part of its submission to the State Water Resources Control Board.

5. EBMUD may elect to participate in the Delta Wetlands Project Fishery Technical Advisory Committee. Delta Wetlands shall notify the Department of Fish and Game that EBMUD may participate on the Technical Advisory Committee and is to be provided notice of all Technical Advisory Committee meetings and discussions.

6. This Agreement shall be binding upon and inure to the benefit of the successors in interest and legal representatives of the respective parties.

7. All changes or modifications to this Agreement shall be in writing and signed by EBMUD and Delta Wetlands or their successors.

8. The signatories hereto represent that they are authorized to enter into this Agreement on behalf of the party for whom they sign. This document may be executed in duplicate originals.

DELTA WETLANDS PROPERTIES, an Illinois general partnership

By: KLMLP, L.P., a Delaware limited partnership, Special Partner

By: ZKS Real Estate Partners, LLC, a Delaware limited liability company, its authorized agent.

Dated: Sep 7, 2000

By _____
Frederick L. Stephens, President

EAST BAY MUNICIPAL UTILITY DISTRICT

Dated: 9/14/00

By _____
Dennis M. Diemer, General Manager

ATTACHMENT A
FISHERIES TERMS AND CONDITIONS

Webb Tract Operations

From January 1 to June 30, Permittee's Webb Tract operations shall be in accordance with the following diversion protocol:

1. Diversions to storage shall be made through the southeastern siphon station, except that;

2. Only after the southeastern station siphon is operating at full capacity, or in excess of 90% of full capacity due to maintenance and repair, may diversions to storage be made through the northeastern siphon station;

3. Any reductions in diversions to storage shall first be accomplished by curtailing diversions at the northeastern siphon station. Only after diversions to storage at the northeastern siphon station are reduced to less than 50 cfs shall reductions in diversions begin at the southeastern station.

4. Permittee may operate the northeastern siphon station only when diversions through the southeastern siphon station are projected to be insufficient to completely fill storage on Webb Tract within 30 days. Permittee shall then operate the northeastern siphon station at or below the rates projected to fill said storage by the end of this same 30-day period. Permittee shall report Webb Tract diversion rates and storage amounts to the Technical Advisory Committee on an annual and monthly basis, in accordance with the provisions outlined in the Water Quality Management Plan or other applicable terms and conditions.

5. This diversion operations protocol is not applicable (1) if the U.S. Fish and Wildlife Service ("USFWS") determines that delta smelt eggs, larvae, juvenile or adult life stages are found at the Webb Tract southeastern siphon monitoring stations, as set forth in the USFWS Final Biological Opinion, or (2) if the 3-day running average of salinity or dissolved organic carbon ("DOC") at the northeastern siphon station is more than 10% lower than the 3-day running average of salinity or DOC at the southeastern siphon station. This 10% salinity/DOC exception to the protocol is not expected to occur more than once every five years. If, however, this 10% salinity/DOC exception occurs more frequently than once every five years, then the diversions at the northeastern siphon station resulting from this exception may not exceed 25 thousand acre feet per year nor exceed a diversion rate of 1,375 cfs, without express written authorization from EBMUD. In the event that this salinity/DOC exception is triggered, Permittee shall reimburse EBMUD up to an additional $5,000 as provided and pursuant to paragraph 16 set forth below.

6. The diversion operations protocol is not applicable during routine repairs and maintenance of the southeastern siphon station, with such exception limited to a maximum of three days per month.

7. Any additional siphons or screening capacity constructed by Permittee will also be subject to the diversion protocol. Any such additional siphons or screening capacity will be added to the southeastern siphon station whenever possible.

Siphon Removal

8. Permittee shall limit the number of existing siphons on Bouldin Island to no more than 14. This will require Permittee to remove a number of existing siphons. This reduction shall be applied uniformly around the island. All remaining siphons shall be screened as set forth in the USFWS' Final Biological Opinion.

9. Permittee shall limit the number of existing siphons on Webb Tract to no more than 7. This will require Permittee to remove a number of existing siphons. This reduction shall be applied uniformly around the island, except that at least 50% of the existing siphons along the San Joaquin River shall be removed so that no more than 4 siphons remain on the San Joaquin River. All remaining siphons shall be screened as set forth in the USFWS' Final Biological Opinion.

10. Permittee shall complete the above-referenced siphon removal prior to beginning diversions on Webb Tract under Permittee's new water rights. Permittee shall provide EBMUD with written notice of removal within thirty days of completion of siphon removal.

Boat Docks

11. Permittee shall limit the addition of new boat docks on the exterior of Bouldin Island to no more than 150. New boat docks on the Mokelumne River shall be limited to no more than 75.

12. Permittee shall limit the addition of new boat docks on the exterior of Webb Tract to no more than 198. New boat docks on the San Joaquin River shall be limited to no more than 30.

13. The location of Permittee's new boat docks on Bouldin Island and Webb Tract shall be based on recommendations by the Technical Advisory Committee with consideration given to the proximity of the proposed new boat docks to proposed new shallow water habitat.

Webb Tract Fisheries Monitoring Program

From January 1 to June 30, Webb Tract diversions to storage from the northeastern siphon station that exceed 50 cfs shall require fishery monitoring as described below:

14. No later than January 1, February 1, and March 1 of each year, Permittee shall provide to EBMUD a monthly operations plan showing when diversions to Webb Tract and Bouldin Island are anticipated to take place for the subsequent four month period.

15. No less than three days prior to commencing diversions which exceed 50 cfs to Webb Tract or Bouldin Island, Permittee shall notify EBMUD of its proposed diversion.

16. In any year when Permittee operates its northeastern Webb Tract diversion station and EBMUD finds juvenile chinook salmon have begun outmigrating from the Mokelumne River as determined by a two-day running average of over 25 fish per day at Woodbridge Dam, Permittee will reimburse EBMUD up to $50,000 per year in year 2000 dollars (adjusted annually for inflation by the Consumer Price Index for All Items - All Urban Consumers for the San Francisco-Oakland-San Jose Metropolitan Statistical Area) for monitoring expenses and the cost to obtain any necessary permits for monitoring in the immediate vicinity of the northeastern Webb Tract diversion station and associated boat docks.

17. Monitoring shall be performed for the first five years of actual operation (these might not be consecutive years) of Permittee's northeastern Webb Tract diversion station. If the Mokelumne River juvenile anadromous fish are not present on the screens of the northeastern diversion structure or are not in the stomachs of predators in the immediate vicinity of the northeastern diversion structure during this period, then no further monitoring shall be required.[1] If, however, Mokelumne River juvenile anadromous fish are present on the screens of the northeastern diversion structure or in the stomachs of predators in the immediate vicinity of the northeastern diversion structure, this monitoring program and its associated mitigation (described in Paragraph 18, below) will continue until such time as the monitoring program fails to detect the presence of these fish for three consecutive years of operation.

18. If this monitoring program identifies that Mokelumne River juvenile anadromous fish are present on the screens of the northeastern diversion structure or in the stomachs of predators in the immediate vicinity of the northeastern diversion structure, Delta Wetlands will immediately reduce its diversions at the northeastern Webb Tract diversion station by 50% of the then current diversion rate, or down to an instantaneous diversion rate of 50 cfs, whichever is greater.

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[1]For purposes of this agreement, Mokelumne River juvenile anadromous fish are any juvenile salmonids bearing an adipose fin clip. In the event tagging techniques are modified by EBMUD, or others, that eliminates the ability to distinguish Mokelumne River juvenile anadromous fish, EBMUD shall notify Permittee and modify this definition to enable proper identification of the Mokelumne River juvenile anadromous fish.

ATTACHMENT B
GEOTECHNICAL TERMS AND CONDITIONS

Reservoir Island Design Review Board ("DRB")

1. Members:

   a. Number: Three.

   b. Qualifications: Registered professional civil engineers with experience providing engineering services in the Sacramento-San Joaquin Bay-Delta. At least one member shall be a geotechnical engineer.

   c. Appointed by: Delta Wetlands Properties ("DW" or "Permittee").

   d. While not members of the Design Review Board ("DRB"), parties such as EBMUD that hold property interests adjacent to Bacon Island or Webb Tract (the Project reservoir islands) or parties that could be substantially affected by the reservoir operations and have appeared in the DW water rights hearing, shall have the ability to participate in DRB meetings, comment on design, and shall be provided a copy of all DRB minutes so that such parties can monitor the design and construction of the Project reservoir islands.

2. Duties: Permittee shall submit Project reservoir island plans and specifications to the DRB. The DRB shall review and comment on the plans and specifications during staged design review and during construction for the Bacon Island and Webb Tract Project improvements, confirming that Project design meets the stated objectives of the Project description as defined in the 2000 Revised Draft Environmental Impact Report/Statement and the Delta Wetlands Seepage Control Plan (Attachment C), including but not limited to: levee factors of safety, wave protection for levees, levee slopes, seepage control, and monitoring programs. Comments of the DRB shall be provided to the SWRCB, Permittee, EBMUD, and to local reclamation districts adjacent to the Project reservoir islands.

3. Compensation: Members of the DRB are to be compensated by Permittee for their time, in an amount up to but not to exceed $300,000. The DRB shall cease to exist once its duties, as set forth in paragraph 2, are completed.

Reservoir Island Monitoring & Action Board ("MAB")

4. Members:

   a. Number: Three, with two alternates.

   b. Qualifications: The two primary members shall be registered professional civil geotechnical engineers with experience providing engineering services in the

Sacramento-San Joaquin Bay-Delta. The third member and the two alternate members shall be licensed professionals with experience in seepage in the Sacramento-San Joaquin Bay-Delta.

c. Appointment Process: The State Water Resources Control Board ("SWRCB") shall appoint one member and DW shall appoint one member. In the event the SWRCB does not so appoint one MAB member, then DW shall instead appoint that member after first meeting and conferring with EBMUD on the independence and objectivity of the proposed appointment and after allowing EBMUD an opportunity to object to the appointment. No appointment of this one MAB member shall be made over the objection of EBMUD. These two members ("primary members") shall appoint the third member and the two alternate members. Any party to the Delta Wetlands SWRCB hearing may provide suggestions to the SWRCB as to who to appoint to the MAB. Each of the MAB members shall be appointed for a term of four years. At the end of the four-year term, the same selection process will be used to select the MAB.

5. Term: The MAB shall be established prior to the first diversions to storage on Bacon Island or Webb Tract and shall continue thereafter for the duration of Project reservoir operations on Bacon Island and/or Webb Tract.

6. Compensation: Members of the MAB are to be compensated by Permittee for their time on an hourly basis. Such costs, including costs of reports which may be prepared and studies which may be undertaken by the MAB shall be part of the annual operation and maintenance costs of the Project.

7. Duties:

a. Permittee shall submit Project monitoring and seepage data to the MAB so that the MAB can fulfill its duties. During the first year of Project reservoir island operations, the MAB shall serve as a neutral technical engineering advisor and shall review monitoring and seepage data at each stage of initial reservoir filling. Following that initial filling, the MAB shall review monitoring and seepage data at a minimum of every three months during the remainder of the first year of Project reservoir island operation.

b. The MAB shall serve as a neutral technical engineering advisory panel, hearing and investigating identified problems purportedly caused by Permittee's reservoir operations, including but not limited to levee weakness, overtopping of levees, levee failure, scour at EBMUD's Mokelumne Aqueduct river crossings, and seepage. The MAB shall also issue Reports containing its recommendations on remedial actions to correct problems, as set forth in paragraph 14.

c. The terms of the Delta Wetlands Seepage Control Plan (Attachment C) may be adjusted over time by the SWRCB as set forth below. The SWRCB reserves jurisdiction over changes in the Delta Wetlands Seepage Control Plan to coordinate

or modify its terms for the protection of other legal users of water, fish, wildlife, instream beneficial uses, and the public interest as future conditions may warrant. The SWRCB delegates authority to the Executive Director of the SWRCB to take actions under this reservation of jurisdiction as set forth below.

(i) During the third year of Project operations, the MAB shall review the Delta Wetlands Seepage Control Plan to determine if changes in any of the Seepage Control Plan's terms are advisable. In its review, the MAB shall examine actual operation of the Project to date and any adverse effects of Project reservoir operations, including impacts on neighboring levees and islands. The MAB will base each of its recommended changes to Plan terms, if any, on its independent, professional judgment. At the conclusion of its review, the MAB shall issue a written list of its recommended changes, if any. The list shall be sent by the MAB to the SWRCB, Permittee, EBMUD, all Interested Parties who have notified Permittee as set forth in paragraph 9, and all parties to the Delta Wetlands SWRCB hearing ("Noticed Parties").

(ii) If Permittee, EBMUD, Noticed Parties and Interested Parties (as limited above) do not object to a change recommended by the MAB within 30 days of service of any proposed change, then the Executive Director of the SWRCB may approve the change without the need for a comment period or hearing. In the event of any objection, the SWRCB may only approve the change after it provides notice of and an opportunity to comment on the proposed change to Permittee, EBMUD, Noticed Parties and Interested Parties (as limited above). If requested by Permittee, EBMUD, a Noticed Party or an Interested Party (as limited above), the SWRCB may hold a hearing on the proposed change.

d. After its initial three-year review of the Delta Wetlands Seepage Control Plan as set forth above, the MAB may thereafter periodically review and change the terms of the Delta Wetlands Seepage Control Plan so long as the review and approval process set forth above is followed.

Dispute Resolution Procedure

8. Delta Wetlands and EBMUD set forth the following process to identify and remedy levee, seepage and related problems which may be caused by Project reservoir islands operations. The parties recognize, however, that in the event of an emergency, such as an imminent levee failure, there is a need for rapid action such that there may not be time for this process to take place. In the event of emergency, an Interested Party or reclamation district may notify Permittee of a problem by any available method.

9. Any entity or individual who may be injured by the reservoir operations of the Delta Wetlands Project ("Interested Party") may elect to seek a remedy through the Dispute Resolution Procedure set forth below. If such an Interested Party elects to utilize said Dispute Resolution Procedure, then the Interested Party shall notify Permittee and MAB in

writing of such election and shall be bound by all provisions set forth therein, including but not limited to paragraph 16.

10. Method of Notification: Except in cases of emergency, all notifications, determinations, completion notices, objections, and reports shall be in writing delivered by U.S. Mail, courier, messenger, facsimile or electronic mail. All written notifications, determinations, completion notices, objections, and reports must be signed by a registered engineer.

11. Notification of Problem: EBMUD, or any Interested Party that has elected to use the Dispute Resolution Procedure as set forth in paragraph 9, may notify Permittee of perceived problems caused by the Project, including but not limited to, indications of levee failure and/or seepage on Project reservoir islands or on adjacent islands. EBMUD or Interested Party shall hereafter be referred to as "Complainant."

    a. Contents of Notification: The Notification shall specify the type of problem identified, its location and when it was observed.

    b. Notification Sent to: The Notification shall be sent by Complainant to the SWRCB, Permittee, the MAB, and to the secretary of any reclamation district for land on which the identified problem is occurring.

12. Determination by Permittee: Upon receiving a written Notification pursuant to paragraph 11, Permittee shall investigate the problem. Within five working days of receiving said written Notification, Permittee shall provide a written Determination to the SWRCB, Complainant, the MAB, and to the secretary of any reclamation district to whom the Notification was sent.

    a. Contents of Determination: The Determination shall outline what actions Permittee took to investigate the identified problem, Permittee's conclusions as to the nature of the problem, an explanation of what remedial actions, if any, Permittee will take to correct the problem, and when any such remedial actions will be commenced and completed.

    b. Upon Permittee's completion of any such remedial actions, Permittee shall provide a written completion notice to the SWRCB, Complainant, the MAB, and the secretary of any reclamation district to whom the Notification was sent. The notice shall state what remedial actions were taken and when they were completed.

13. Objection to Permittee's Determination: In the event Complainant disagrees with all or part of Permittee's Determination, Complainant within five working days of receipt of Permittee's Determination, shall send to the SWRCB, Permittee, the MAB and to the secretary of any reclamation district to whom the Notification was sent, a written Objection to the Determination.

a. Contents of Objection: The Objection shall outline to which portions of the Determination Complainant objects and why. Complainant may also state its view of the problem and remedy.

14. MAB Report: Upon receipt of an Objection pursuant to paragraph 13, the MAB shall commence its own independent investigation of the matter. Permittee and/or Complainant may submit additional material to the MAB to assist in its investigation, so long as the other party is copied. If, in the opinion of the MAB, additional technical studies are necessary to its investigation, it may undertake or authorize such studies. The costs of any such studies shall be paid for as set forth in paragraph 6.

a. Within seven working days of receiving the written Objection, the MAB shall issue a written Report. Said Report shall be sent to the SWRCB, Permittee, Complainant and to the secretary of any reclamation district to whom the Notification was sent.

b. Contents of Report: The Report shall include the MAB's independent opinion on the nature of the problem, its recommendation on what remedial actions should be taken by Permittee to correct the problem, if any, and a schedule of when any such remedial actions should be commenced and completed by Permittee. The MAB shall only recommend remedial actions which address problems determined to be caused by Project reservoir operations though, if necessary, it may identify other causes only for explanatory purposes.

15. Permittee's Compliance with the Report: Permittee shall implement all recommended remedial measures listed in the MAB's Report by the deadlines included therein, and shall be solely responsible for the costs of said measures.

16. Frivolous Claims: If the Permittee believes the Complainant has filed a frivolous Notification pursuant to paragraph 11, then Permittee may, within fifteen days of receiving the MAB Report, request the MAB to determine whether the Notification by Complainant is totally and completely without merit (frivolous). If the Notification is determined to be frivolous, Complainant shall pay all costs and fees of investigating the claim incurred by the MAB.

17. Judicial Remedy: Nothing in these terms and conditions shall constitute a waiver of the rights of Permittee or Complainant to pursue judicial remedies in state court regarding an MAB Report.

Financial Assurances

18. The following four classes of financial assurances shall be required so long as the Project is owned by any party other than the state and/or federal government(s). In the event the Project is owned and operated by the state and/or federal government(s), then these provisions shall not apply. However, any governmental entity that purchases or leases the Project shall hold a financial reserve account for the Project that is sufficient to cover the annual costs of Project operations or shall provide equivalent assurances.

19. **Seepage and Monitoring Fund:** The parties wish to ensure that, prior to any diversions to storage on Bacon Island or Webb Tract in each and every year of Project operation, the Permittee have sufficient capital resources on hand to operate the seepage control and monitoring systems for the full year. To meet this objective, the following funding mechanism shall be utilized.

First Year of Operation. Prior to the first diversion to storage on a Project reservoir island, Permittee shall deposit, in an interest-bearing account in a financial institution licensed to do business in the State of California who will act as the escrow agent, with interest accruing to Permittee, $500,000 to be used for the first year's annual operating expenses of the Project's reservoir island seepage control and monitoring systems. Permittee may draw upon said monies over the course of the year only to cover routine incurred expenses for seepage control and monitoring on the two Project reservoir islands.

Following Years. Prior to the first diversion to storage on a Project reservoir island in each and every water year thereafter, Permittee shall deposit into said account a sum of money the MAB estimates, as provided below, will be required for the complete annual operating costs of the Project's reservoir island seepage control and monitoring systems for that upcoming water year. Permittee may draw upon said monies over the course of the water year only to cover routine incurred expenses for seepage control and monitoring on the two Project reservoir islands.

Estimate. No later than September 1 of each year, Permittee shall file with the MAB a written estimate of the amount of money required for the complete annual operating costs of the Project's reservoir islands seepage control and monitoring systems for the upcoming water year. (The water year shall be October 1 through September 30.) The MAB shall review that estimate and, in its own discretion, set an amount of money it estimates will be needed to operate the Project reservoir islands seepage control and monitoring systems for that upcoming water year. Said sum shall not be less than the prior year's actual seepage and monitoring costs. Permittee shall then deposit that amount of money in the designated account, as provided above.

Records. Permittee shall provide proof of deposit of the estimated annual seepage and monitoring costs to the MAB prior to the first diversion to storage on a Project reservoir island in each year of operation. Permittee shall maintain all books and records on the utilization of said account monies for each year of Project operation and shall submit to the SWRCB and MAB, no later than October 15 of each year, an accounting of how said monies were expended in the prior water year.

20. **Drawdown Fund:** The parties wish to ensure that, in the event Permittee abandons the Project or otherwise does not operate the Project after water has been diverted to storage on a Project reservoir island, there are sufficient capital resources on hand to empty the Project reservoir islands.

First Year of Operation. Prior to the first year of reservoir operations, Permittee shall deposit, in an interest-bearing account in a financial institution licensed to do business in the State of California who will act as the escrow agent, with interest accruing to Permittee, $1,000,000 to cover the expense of emptying the Project reservoir islands. Permittee may draw upon said monies over the course of the year to cover routine expenses of discharging water from the Project reservoir islands as part of normal operations.

Following Years. Prior to the first diversion to storage on a Project reservoir island in each and every water year thereafter, Permittee shall deposit into said account a sum of money the MAB estimates, as provided below, will be required for the complete annual operating costs of the Project's discharge operations for that upcoming water year. Permittee may draw upon said monies over the course of the water year only to cover routine incurred expenses for discharge of stored water on the two Project reservoir islands.

Estimate. No later than September 1 of each year, Permittee shall file with the MAB a written estimate of the amount of money required for the complete annual operating costs to discharge water from the Project reservoir islands for the upcoming water year. (The water year shall be October 1 through September 30.) The MAB shall review that estimate and, in its own discretion, set an amount of money it estimates will be needed to discharge water from the Project reservoir islands for that upcoming water year. Said sum shall not be less than the prior year's actual discharge costs. Permittee shall then deposit that amount of money in the designated account, as provided above.

Records. Permittee shall provide proof of deposit of the estimated annual discharge costs to the MAB prior to the first diversion to storage on a Project reservoir island in each year of operation. Permittee shall maintain all books and records on the utilization of said account monies for each year of Project operation and shall submit to the SWRCB and the MAB, no later than October 15 of each year, an accounting of how said monies were expended in the prior water year.

21. **Remedial Actions:** The parties wish to ensure that, in the event Permittee determines to take corrective actions in response to a Complainant's Notification or if the MAB recommends remedial actions to correct identified problems, Permittee will have sufficient capital resources on hand to implement those actions.

Prior to the first diversion to storage on a Project reservoir island, Permittee shall deposit, in an interest-bearing account in a financial institution licensed to do business in the State of California who will act as the escrow agent, with interest accruing to Permittee, $1,000,000. This fund shall be available for use by Permittee only to implement corrective actions in response to a Complainant's Notification or to implement remedial measures recommended by the MAB.

In the event this Remedial Action Fund is so used by Permittee, Permittee shall, prior to again diverting to storage on a Project reservoir island, deposit sufficient monies into said account so that its balance returns to its minimum required level. Its minimum required level shall be $1,000,000, as adjusted annually for inflation by the ENR Construction Cost Index

for San Francisco (ENR CCI-SF) for the life of the Project. In the event this Remedial Action Fund is not used by Permittee during ten years of reservoir operations, then such fund shall be canceled and the monies deposited shall revert back to Permittee.

Records. Permittee shall provide proof of deposit of the Remedial Action Fund to the MAB prior to the first diversion to storage on a Project reservoir island, and if the Remedial Action Fund is drawn upon, Permittee shall again provide proof of deposit of sufficient funds to maintain the balance at the minimum required level prior to again diverting to storage on a Project reservoir island. Permittee shall maintain all books and records on the utilization of said account monies for each year of Project operation and shall submit to the SWRCB and the MAB, no later than October 15 of each year, an accounting of how said monies were expended in the prior water year.

22. **Insurance:** The parties wish to ensure that in the event of damage caused by the Project, sufficient capital resources are available to reimburse damaged parties.

Permittee shall take out and maintain, during the life of the Project, General Liability Insurance that provides protection from claims that may arise from Project reservoir islands operations. Permittee shall annually submit certificates of said insurance to EBMUD. The policy shall not be cancelled or materially altered unless 30 days' written notice is given EBMUD. The amounts of insurance coverage shall not be less than $25,000,000/ Occurrence, Bodily Injury, Property Damage - General Liability.

ATTACHMENT C
DELTA WETLANDS SEEPAGE CONTROL PLAN

I. INTRODUCTION

A. Description of Seepage

The Delta Wetlands ("DW") Project consists of four islands. Water will be stored on the two reservoir islands (Bacon Island and Webb Tract) up to elevation +6 feet. On the habitat islands (Bouldin Island and Holland Tract), water levels will be managed for a range of crops and habitats, some of which include shallow flooding. DW intends to control groundwater in the vicinity of its reservoir islands in such a way that there is no seepage beyond that which would be produced by other uses of the DW reservoir islands currently allowed (such as intensive agriculture or shallow flooded wetlands). Controlling seepage to within these limits is referred to as "no net seepage impact".

The method by which a reservoir on Bacon Island and/or Webb Tract could create a seepage impact on an adjacent island is flow through a connecting sand aquifer extending beneath both islands. Seepage flowing from one island to the next will raise the hydrostatic head in the aquifer beneath the neighboring (receiving) island. The presence or absence of a connecting aquifer is not known at many locations. If there is a connecting aquifer and if seepage is occurring from a reservoir island through the aquifer to a neighboring island, the hydrostatic head in the aquifer beneath the neighboring island will rise and fall with the filling and emptying of the reservoir. DW will monitor the hydrostatic head in the aquifers beneath neighboring island levees to check that no seepage is occurring from DW Reservoirs. Several types of "wells" are used to control and monitor seepage. Their definition and relative location are shown on Figure C-1 (attached).

B. Groundwater Monitoring Wells

Two suites of groundwater monitoring wells will be installed.

To check whether the reservoir water level on Bacon Island or Webb Tract is affecting an adjacent island, Permittee will install seepage monitoring wells along a neighboring island's perimeter directly across from the Bacon Island and Webb Tract Reservoir islands.[1] These will be the primary tool for detecting seepage from a reservoir island. If water stored on a DW reservoir island creates added seepage toward a neighboring island, the increased hydrostatic head that would be part of the seepage can be measured in monitoring wells penetrating the aquifer transmitting the water.

To check the overall groundwater behavior in the Delta, unrelated to operation of the DW Project, a series of background monitoring wells will be installed at locations sufficiently far removed from the Bacon Island and Webb Tract reservoirs as to not be influenced by water storage

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[1]The installation of monitoring wells is subject to the approval of the neighboring island owner(s). If approval is unreasonably withheld, alternative locations will be utilized.

within the reservoirs. The measured groundwater levels will be normalized (as described below) and averaged to develop an overall characterization of the groundwater trends in the central portion of the Delta.

C. Pre-Project Baseline

To collect baseline[2] data on the overall groundwater system performance as it relates to agricultural practices or wetlands management, the groundwater monitoring wells (both seepage monitoring wells and background monitoring wells) will be monitored by DW continually for at least one year prior to the start of reservoir filling. The same measurements will be taken by DW year round, once the Project is implemented.

D. Detecting Seepage

To assess whether filling Bacon Island or Webb Tract may be impacting the groundwater level beneath neighboring islands, the groundwater levels in the seepage monitoring wells beneath adjacent islands will be compared by DW to the baseline records at those same locations. Concurrently, the overall groundwater performance of the Delta will be measured by DW in the background monitoring wells. Those locations showing increases above baseline range (adjusted for extreme variations in overall Delta groundwater performance), that coincide with filling the reservoir, will be the basis for suspending water diversion onto the nearby reservoir island. Details regarding how the various data will be compared are described in Section III set forth below. The above monitoring observations will be made on a continuing basis, allowing DW to observe the start of trends that may indicate possible seepage from the reservoirs. The goal of DW is to be proactive and to make needed groundwater control adjustments far in advance of the Diversion Suspension Limits.

E. Initial Stage Filling of Reservoirs

When the Project first begins to operate, water storage will be implemented on a vertical stage-filling basis. Water within the reservoir will first be brought to a fairly low level, not more than 25% of storage capacity, and held constant for a period of time until sufficient data are collected to verify that no net seepage impacts are occurring on neighboring islands. If impacts are found that require controlling measures, filling of the reservoir will be put on hold until appropriate measures can be brought on line so as to not cause additional risk to neighboring island levees. Such actions could include increasing the pumping capacity of interceptor wells, installing additional interceptor wells, installing relief wells on a neighboring island, and/or other mitigation that may be agreed upon among DW, the adjacent landowners, and the reclamation districts.

If impacts are not detected, the reservoir will be further filled to the next vertical stage (approximately 50% of reservoir capacity) and again held constant to allow adequate time for data collection and assessing of possible seepage impacts. This cycle of staged-filling, monitoring

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[2]"Baseline" data refer to data collected prior to the first filling of the reservoir islands. The baseline may be updated during subsequent years of no water storage on the reservoir islands.

seepage, assessing impacts, and correcting impacts will be repeated until the reservoir can be safely brought to full operational level with suitable seepage control measures in place.

F. Routine Operations

The reservoirs will commonly begin filling in late fall to early winter. Both prior to and during filling, the groundwater levels in the seepage monitoring wells will be carefully tracked by DW. The interceptor wells will begin to operate as the reservoir level is raised. Pumping rates will be increased as the pool elevation in the reservoir is raised. All this time, the seepage monitoring wells will be tracked and serve as a control for adjusting the interceptor well pumping rates. The interceptor wells will be pumped such that the water levels in the seepage monitoring wells are kept near the normal seasonal levels.

DW will continually evaluate the efficiency of the interceptor wells to verify that there is sufficient additional capacity to allow the pool elevation to continue to be raised. If the efficiency of a well drops off such that the ability of the well to pump greater volumes of water is in question, DW will redevelop the well to improve its efficiency prior to approaching the well's limits. If additional capacity is not readily available from an existing well, a new well can be drilled to increase the pumping capacity at the reservoir island's perimeter.

The reservoir pool elevation will lower as water is later exported into the adjacent slough or river. As the pool elevation decreases, the pumping rates from the interceptor wells will be gradually lowered, with the goal of keeping the water levels in the neighboring islands seepage monitoring wells near their normal seasonal levels.

During the period with little to no water storage, a thorough evaluation of the efficiency of the wells will be undertaken by DW to identify those wells that may show signs of decreasing efficiency and may be susceptible to overstressing during the following season's storage cycle. The need for additional wells will also be evaluated. To the extent practical, redevelopment of existing wells and installation of additional wells will occur during the off-season.

II. LOCATIONS OF GROUNDWATER MONITORING WELLS

A. Background Monitoring Wells

At least twenty-five (25) background monitoring wells will be sited by DW at an appropriate distance from the reservoir islands. These background monitoring wells will be at least one mile from a reservoir island and most likely will be greater than 11/2 miles from a reservoir island. Recommended typical locations of background monitoring wells are shown on Figure C-2. The purpose of these background monitoring wells is to monitor regional groundwater elevations beyond the reasonable influence of the DW reservoir islands.

B. Seepage Monitoring Wells

At least 100 seepage monitoring wells will be placed on or near levees directly opposite the perimeter of the reservoir islands. The five neighboring islands around the south half of Bacon

Island are Lower Jones Tract, Upper Jones Tract, Woodward Island, Orwood Tract and Palm Tract. Around the northern half of Bacon Island are Holland Tract, Little Mandeville Island (currently flooded), Mandeville Island and Mildred Island (currently flooded). Around Webb Tract are Bradford Island, Twitchell Island, Brannan/Andrus Island, Bouldin Island, Venice Tract, Mandeville Island, Franks Tracts (currently flooded), and Little Franks Tract (currently flooded).

Passing across Upper Jones Tract, Woodward Island and Orwood Tract is the Mokelumne Aqueduct, a critical structure. Flooding on any of the five neighboring islands (Lower Jones Tract, Upper Jones Tract, Woodward Island, Orwood Tract and Palm Tract) around the southern half of Bacon Island may increase the risk of service disruption for the aqueduct. The shortest distance between the levee on the southern half of Bacon Island and a neighboring island levee (centerline to centerline) is about 700 feet. A seepage monitoring well spacing of 1,500 to 2,000 feet on a neighbor island levee will provide essentially full coverage of a continuous aquifer at these distances. However, allowing for an importance or risk factor associated with the Mokelumne Aqueduct, DW will use minimum seepage monitoring well spacings of 500 to 1,000 feet for center-to-center levee distances of between 700 to 1,200 feet. For levees beyond a distance of 1,200 feet from a Bacon Island levee, seepage monitoring well spacing will be 1,500 to 2,000 feet. The approximate locations for seepage monitoring wells are shown on Figure C-3.

C. Other Water Level Monitoring

Reservoir stage recording stations will be established within Bacon Island and Webb Tract to document the water surface elevations in the reservoirs. A river stage recording station will be established on the outside perimeters of Bacon Island and Webb Tract to document the water surface elevations in the surrounding rivers and sloughs.

III. EVALUATION OF GROUNDWATER MONITORING WELL DATA

A. Collecting Data Prior to Filling Reservoir and Developing Reference Envelopes

Groundwater monitoring wells (both seepage and background monitoring wells) will be installed by DW at least one year prior to commencement of reservoir filling. Groundwater levels will be recorded using automatic data loggers, measuring and recording the groundwater elevation at least once each hour. The groundwater elevations recorded each day will be averaged to compute the mean groundwater elevation each day ("daily mean") at each groundwater monitoring well location (see Figure C-4). This "daily mean" value will be the primary data used by DW in assessing whether seepage impacts are occurring.

At least one year of groundwater elevation data will be collected from the groundwater monitoring wells prior to the filling of a DW reservoir island. These baseline data will be used as a measure of the initial conditions at these individual groundwater monitoring well locations.

Using the daily means as the data, the annual mean will be computed for each groundwater monitoring well (see Figure C-5). The daily means will be compared with the annual mean and the standard deviation of the difference between the daily means and the annual mean will be computed

for the baseline period. A reference envelope will be developed that is two standard deviations above and below the annual mean for each groundwater monitoring well.

B. Background Monitoring Wells

Data will be collected by DW from background monitoring wells over the same time period as data are collected for the seepage monitoring wells located directly across sloughs from the reservoirs. Daily means of the water level elevations will be calculated for each background monitoring well. Reference envelopes will be computed using at least one full year of pre-reservoir groundwater data to identify plus and minus two standard deviations relative to the annual mean.

After the two standard deviation reference envelopes are created for each background monitoring well for the baseline (pre-reservoir filling) period, subsequent daily mean data for each background monitoring well will be compared with its reference envelope, Figure C-6a. To normalize the data, the lower reference line value will be subtracted from the daily mean. The algebraic difference will then be divided by the height of the envelope (plus or minus two standard deviations). The daily mean for each background monitoring well will be reported as a percent of its envelope height, Figure C-6b. A normalized plot will be prepared comparing the current background groundwater data to the height of the plus or minus two standard deviation baseline envelope for the same well and presented as a percentage of its envelope, Figure C-6c.

The above computed normalized percentage results from each of the background monitoring wells will be combined with the results for all other background wells and averaged for each day. They will be plotted versus time, with the hydraulic head expressed as a percent of the background groundwater monitoring wells' reference envelopes, Figure C-6d. The intent of this last plot is to track general groundwater variations that may be occurring in the central portion of the Delta but that are unrelated to water stored by the Project.

DW anticipates that this plot will show increases in groundwater levels during sustained periods of locally heavy rainfall and low evapotranspiration and during higher water levels in the rivers and sloughs as a flood stage passes through. Many fields are flooded from mid-fall to winter for a variety of reasons. This shallow flooding will also be detected. Low background groundwater levels are expected during late spring through early autumn when evapotranspiration is high and rainfall negligible.

Individual seepage monitoring wells or groups of seepage monitoring wells showing similar responses to those indicated by the average background conditions will indicate that the individual seepage monitoring wells or groups of seepage monitoring wells are responding to the same regional conditions that are affecting the background monitoring wells.

C. Reservoir Stages

Reservoir stage will be measured by DW within the reservoir islands. The daily means of reservoir stage will be computed and recorded. The reservoir stage daily mean will be shown on a graph of pool elevation versus time, similar in format to the daily mean groundwater elevation plots for groundwater monitoring wells.

D. River and Slough Stages

River and slough stage will be measured by DW and daily means computed. The daily mean of slough and river stage will be shown on a graph of water surface elevation versus time, similar in format to the daily mean groundwater elevation plots for groundwater monitoring wells.

E. Limiting Conditions Using Groups of Groundwater Monitoring

1. General

If the groundwater in a group of three or more contiguous seepage monitoring wells located on neighboring islands surrounding a reservoir island rises more than 0.25 foot above their upper bound envelopes of baseline data and if the timing of the increase correlates with the filling of the reservoir or storage of water in the reservoir (adjusted for changes in the daily means for the background groundwater monitoring wells), the reservoir filling will be stopped. This limiting condition is referred to as the Diversion Suspension Limit. Reservoir filling will not resume until the increased hydrostatic head condition is corrected or otherwise satisfactorily remediated. The details of this evaluation are described below.

2. Correlation with Local Activities

If an individual background monitoring well exceeds its upper base data reference envelope, then the land use practices in the general vicinity of each groundwater monitoring well will be checked to see if the irrigation and/or drainage practices have recently changed. Some groundwater variations may result from changes in land management practices, including irrigation patterns, shallow flooding for leaching the soil and suspension of ditch maintenance for land in a set-aside program. Activities in the nearby river or slough will also be checked. Dredging of rivers or sloughs can have substantial impacts on groundwater levels. DW will contact and query reclamation districts on dredging activity or other substantial marine activity near their islands if a marked increase in groundwater levels is observed.

3. Regional Corrections

The background monitoring well data will track the regional variations occurring in the groundwater levels beyond the influence of the reservoir islands. This evaluation will be both qualitative and quantitative. There is considerable imprecision in attempting to correlate one or more seepage monitoring wells with another well, including the background monitoring wells. DW will use a quantitative correction to the extent that the average background condition is above 80% of the full height of the background reference envelope, shown in Figure C-7a. The additional percentage above the 80% level in the background monitoring wells will be multiplied by the plus or minus two standard deviation baseline envelope for each seepage monitoring well. The resulting product will be added to the upper envelope for each seepage monitoring well as shown in Figure C-7b.

4. Initial Evaluation

The daily mean will be computed by DW for each individual seepage monitoring well for the period of time under consideration (referred to as "current" data). The current data for each seepage monitoring well will be compared with the reference (baseline) envelope for the same groundwater monitoring well. (The reference envelope will have been prepared based on a pre-reservoir-filling period as described above in section III.A and adjusted for average changes in background groundwater levels described in the previous paragraph.)

For each seepage monitoring well in the group, the difference between the current groundwater level and the upper envelope will be computed (see Figure C-8). The differences will be averaged for three or more contiguous seepage monitoring wells. The Diversion Suspension Limit for a group of three or more wells will be defined as exceeding the average difference between the current data and upper reference envelopes by 0.25 feet or more, contingent on the conditions in the following sections.

5. Correlation with DW Activities

Finally, the variation over time for the average of the differences between the current data and the upper envelope for the group of wells under consideration will be compared by DW with the changes in reservoir stages (and interceptor pumping rates) over the same period. This comparison will be used to check whether there is a correlation between the reservoir pool elevation and the measured increased head at the groundwater monitoring wells. If the increased head in the groundwater monitoring well correlates with the fluctuations in reservoir pool elevation and the average increase is 0.25 feet above the envelope after adjustments, this will define the Diversion Suspension Limits. DW will be required to suspend diversions of water into the reservoir and to implement measures to lower the groundwater level at the neighboring island perimeters facing the reservoir island. DW will not be allowed to resume diversions until the indicated seepage is resolved.

F. Limiting Conditions Using Individual Groundwater Monitoring Wells

The following procedure will be used by DW to assess whether an individual groundwater monitoring well on a neighboring island is being impacted by water storage on a reservoir island.

1. The daily mean for an individual groundwater monitoring well will be plotted for a current year against time. The current data will be compared with the reference envelope for this groundwater monitoring well. (The reference envelope will have been prepared based on a pre-reservoir filling period as described in section III.A. and adjusted for average changes in background levels as described in section III.E.3.) If the current water level is less than or equal to one foot above the upper reference line, no action will be indicated based on the single groundwater monitoring well data. If the current groundwater level is greater than one foot above the upper reference line, a seepage impact may be indicated, and the evaluation will continue to the following steps.

2. The land use practices in the general vicinity of the individual groundwater monitoring well, including flooding fields and dredging in the river or slough, will be checked to see if practices have changed as discussed in the previous section.

3. The variation of the individual groundwater monitoring well's daily means will be compared with the changes in reservoir stages recorded over the same period of time and/or marked decreases in interceptor well pumping across from the groundwater monitoring well. If the increased head in the groundwater monitoring well correlates with the fluctuations in reservoir pool elevation (or with marked decreases in interceptor well pumping rates) and the head in the aquifer is more than one foot above the adjusted upper reference envelope, this will be a Diversion Suspension Limit, and DW will be required to suspend diversions of water into the reservoir island. DW will not be allowed to resume diversions into that reservoir island until the indicated seepage is resolved.

G. Future Modifications

The methods described herein are intended to provide a rational and responsive evaluation of changes in groundwater levels and seepage that may be attributed to water storage on Bacon Island and Webb Tract. These methods have been assessed using samples of data collected during the initial groundwater monitoring program previously conducted by DW. If, after implementation of this procedure deficiencies are discovered, EBMUD and/or DW will report such deficiencies to the Monitoring and Action Board for consideration as set forth in paragraph 7.c of Attachment B to the EBMUD and DW Protest Dismissal Agreement.

H. Data Availability

Delta Wetlands will make the following groundwater data publicly available on the internet or similarly accessible means as soon as readily available:

- Daily mean of groundwater level in each seepage and background monitoring well, reference envelope, and any Project adjustments based on background monitoring wells.
- Average normalized groundwater level for all background monitoring wells, presented as a percentage of their reference envelopes.
- Daily mean of pool elevations for both reservoirs.
- Daily mean of water level in slough/river.

Delta Wetlands will also maintain a historical database of the above information.

IV. ACTIONS BY DELTA WETLANDS

Delta Wetlands shall take actions to control seepage. These actions may include the following, and are intended to be taken before seepage reaches the Diversion Suspension Limits.

1. Increase pumping rates in interceptor wells.

2. Lower outfall head at relief wells.

3. Redevelop interceptor wells to improve specific capacity of the wells.

4. Redevelop relief wells to improve specific capacity.

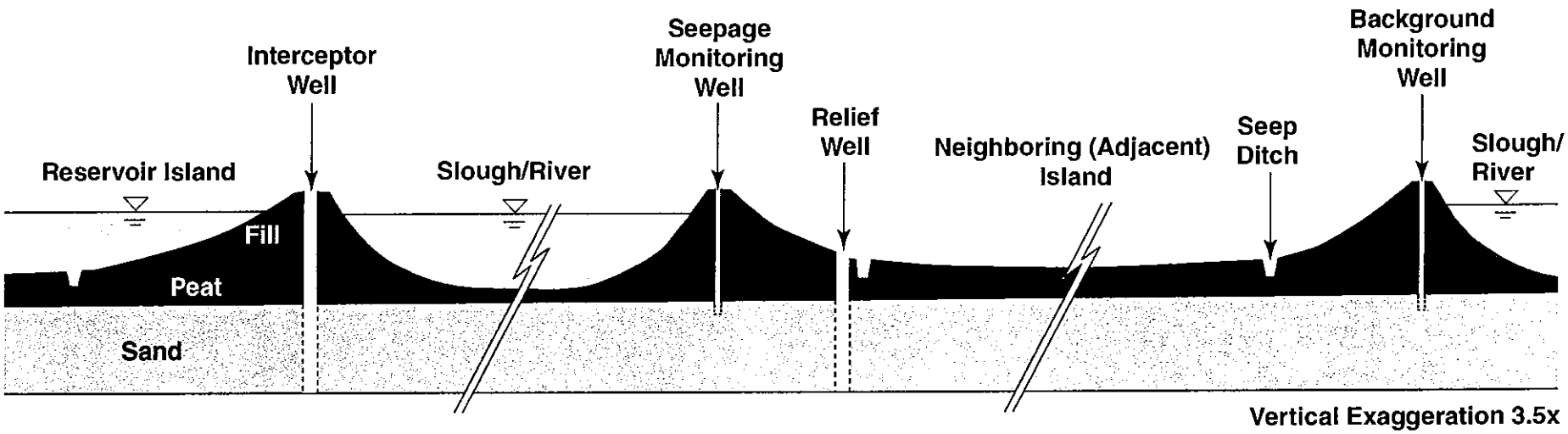
5. Install additional interceptor wells.

6. Install additional relief wells.

7. Implement other mitigation that may be mutually agreeable between Delta Wetlands, the affected adjacent landowners and the neighboring island reclamation district.

8. Stop diversion.

If the Diversion Suspension Limits are reached, DW shall immediately suspend additional water diversion into the reservoir island. Diversions may not renew until groundwater levels are brought below the Diversion Suspension Limits. If DW cannot lower the groundwater to below Diversion Suspension Limits within one week, the reservoir pool elevation shall be lowered at a rate of at least 0.5 feet per day until groundwater levels fall below Diversion Suspension Limits.



Groundwater Monitoring Wells

Seepage Monitoring Wells - Placed at the perimeter of an adjacent island, seepage monitoring wells will detect increased groundwater elevation if increased seepage occurs from slough or reservoir island.

Background Monitoring Wells - Placed far from reservoir islands, often on the far opposite perimeter of an adjacent island. Background monitoring wells will be used as a group to record Delta-wide variations in groundwater levels.

Groundwater Extraction Wells Note: All extraction wells, whether interceptor wells or relief wells, will have slotted screens extending through the full depth of the underlying aquifer.

Interceptor Wells - Pumped wells placed on the perimeter of a resevoir island. The pumping rate will be controlled to essentially capture all water tending to seep from beneath the reservoir perimeter.

Relief Wells - Placed at toe of adjacent island levee. Elevations of the tops of wells will be set such that the wells flow as artesian wells as groundwater surface rises. Where groundwater is not artesian, low head pumps may be used.

Figure C-1
Idealized Cross Section of Well Locations

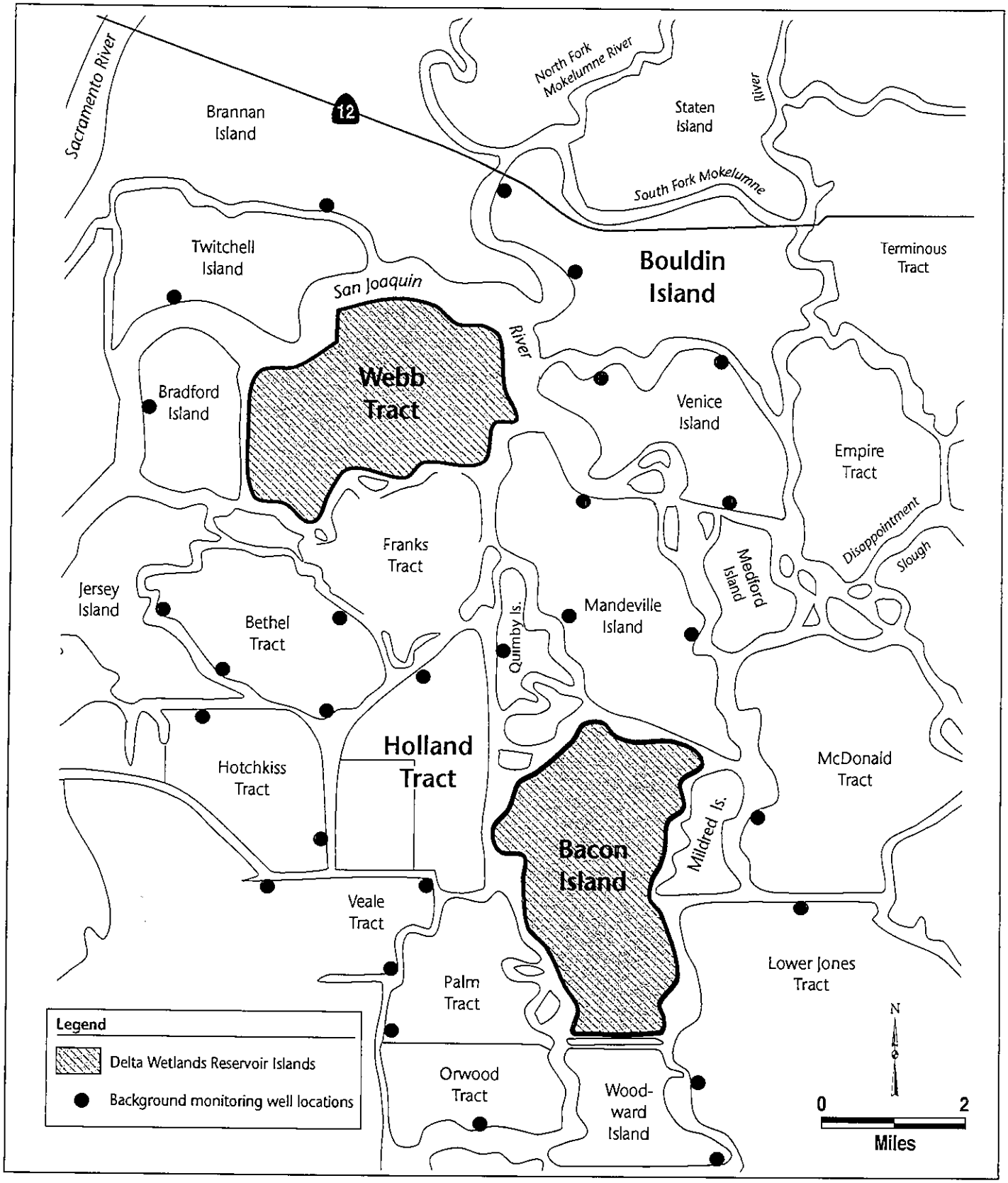


Figure C-2
Approximate Locations of Background Monitoring Wells

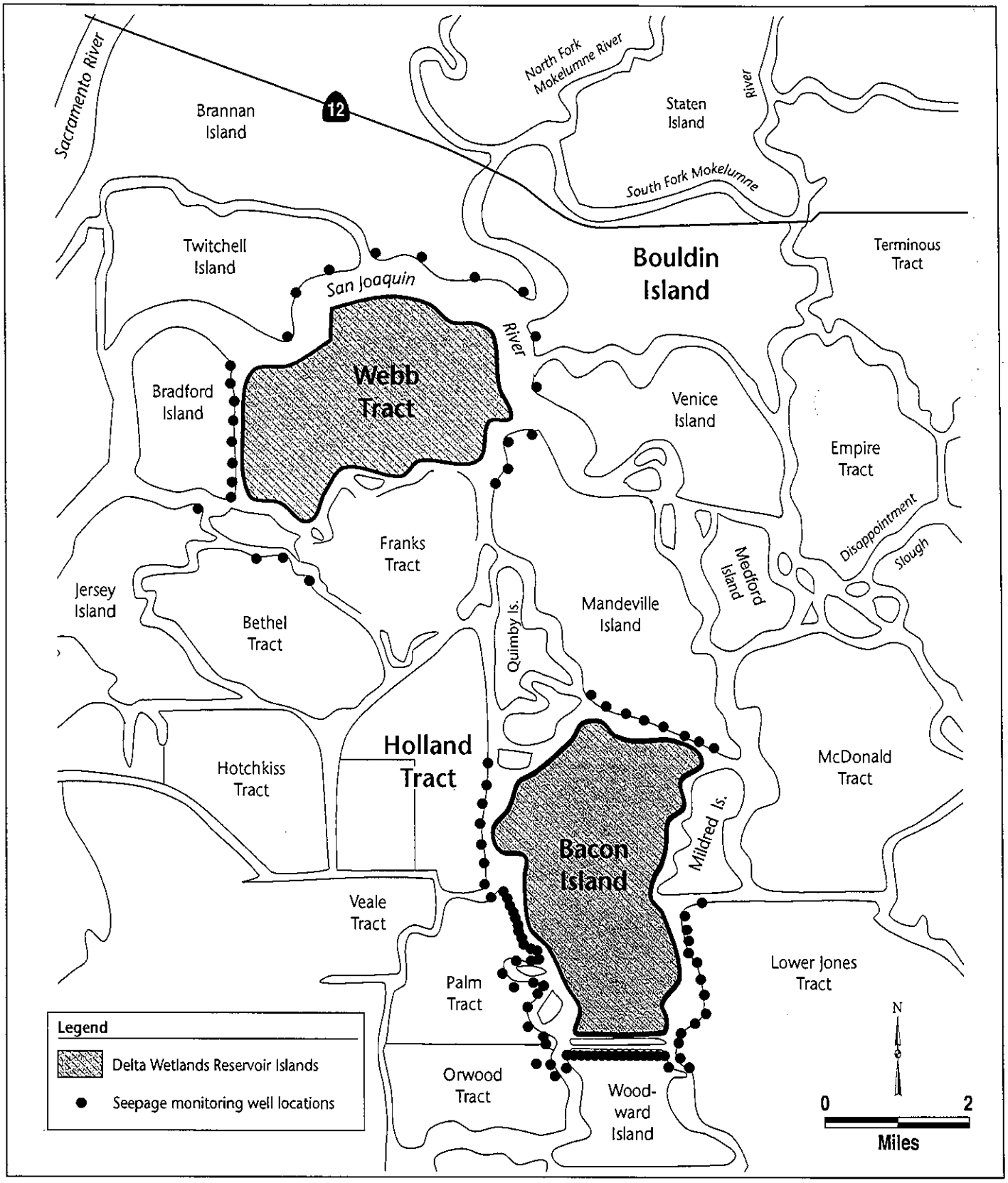


Figure C-3
Seepage Monitoring Well Locations

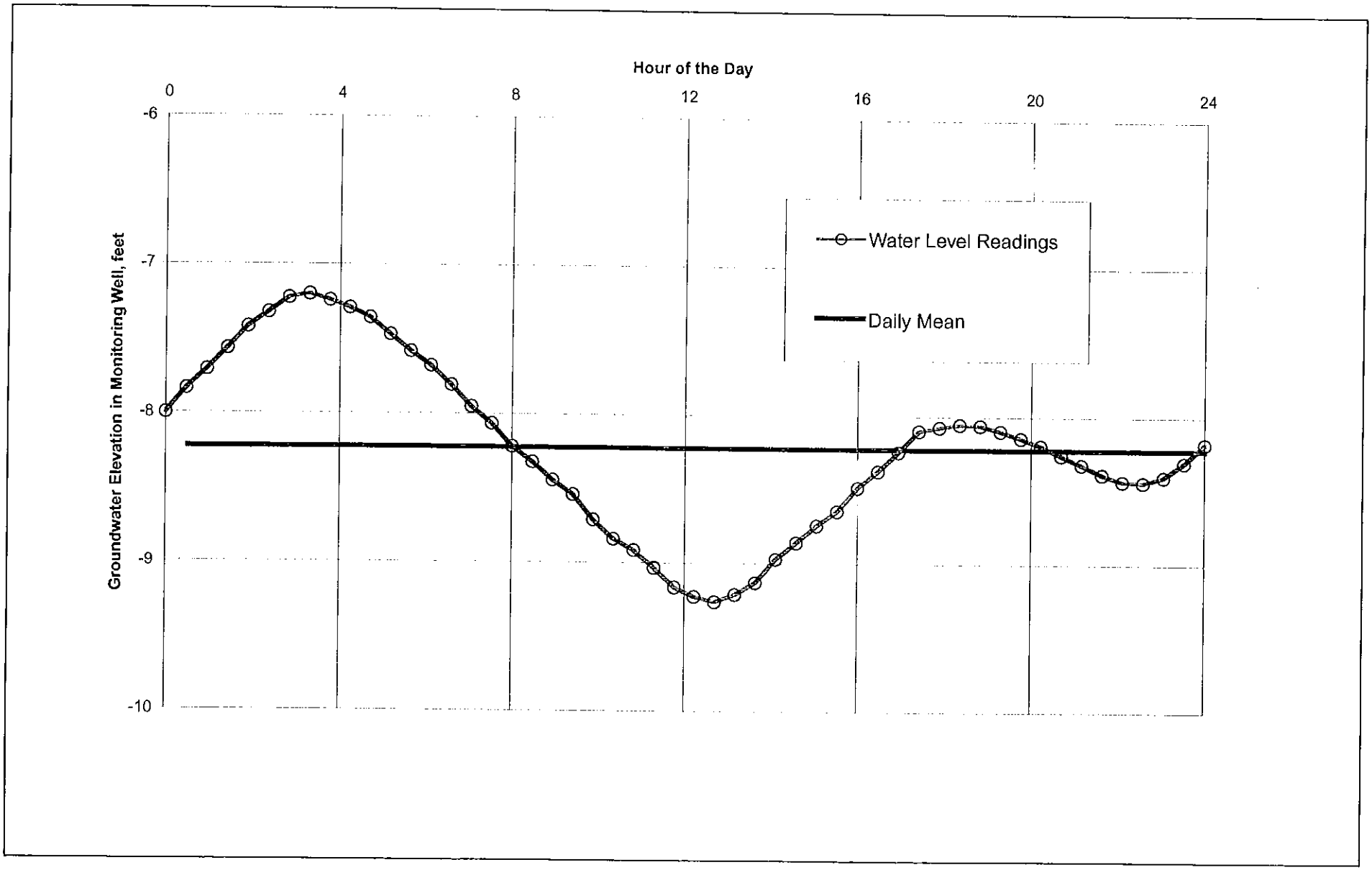
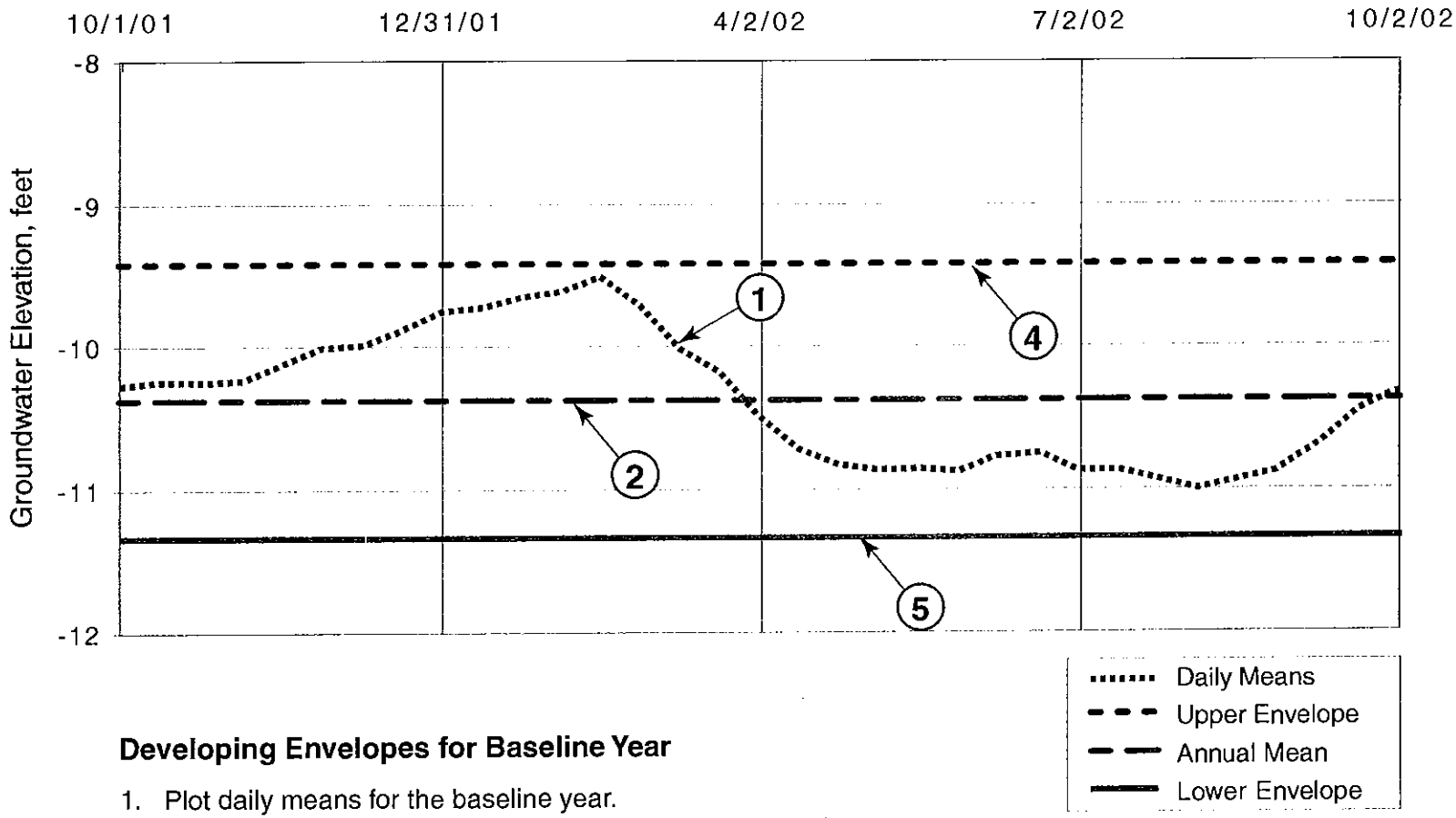


Figure C-4
Daily Mean



Developing Envelopes for Baseline Year

1. Plot daily means for the baseline year.
2. Compute average of daily means and plot as the annual mean.
3. Compute standard deviations of daily means around annual mean.
4. Compute and plot upper envelope as annual mean plus two standard deviations.
5. Compute and plot lower envelope as annual mean minus two standard deviations.

Figure C-5
Reference Envelope for Baseline Year

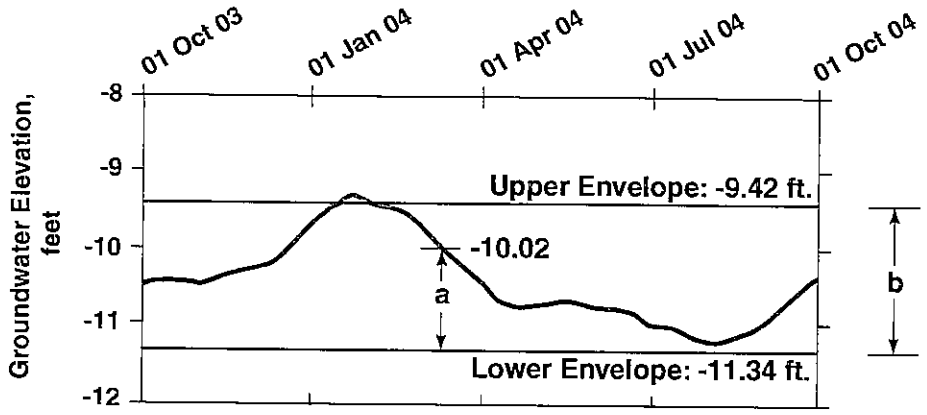


Figure C-6a. Background Monitoring Well Data for a Single Well

To normalize background monitoring well data to its unique envelope, subtract the lower envelope elevation from the daily mean and divide the remainder by the height of the envelope:

a/b = [(-10.02) - (-11.34)] / [(-9.42) - (-11.34)] = 65%

Figure C-6b. Computation for Normalizing Background Monitoring Well Data

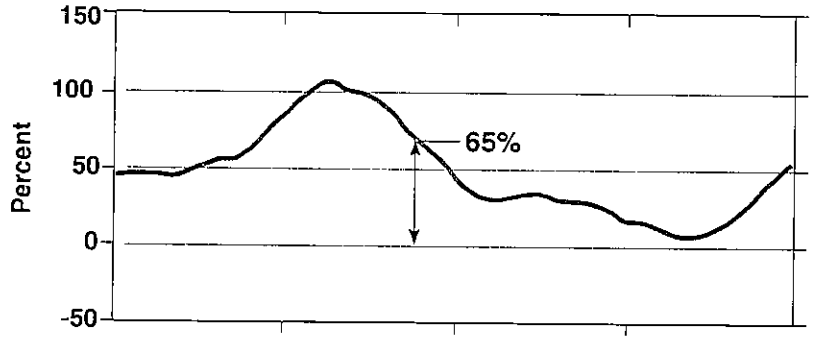


Figure C-6c. Plot of Normalized Background Monitoring Well Data for a Single Well

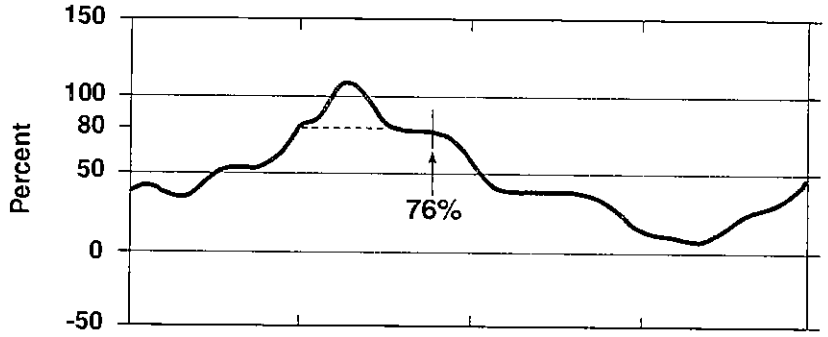


Figure C-6d. Average of Normalized Data for All Background Monitoring Wells

Figure C-6
Normalizing and Averaging Background Well Data

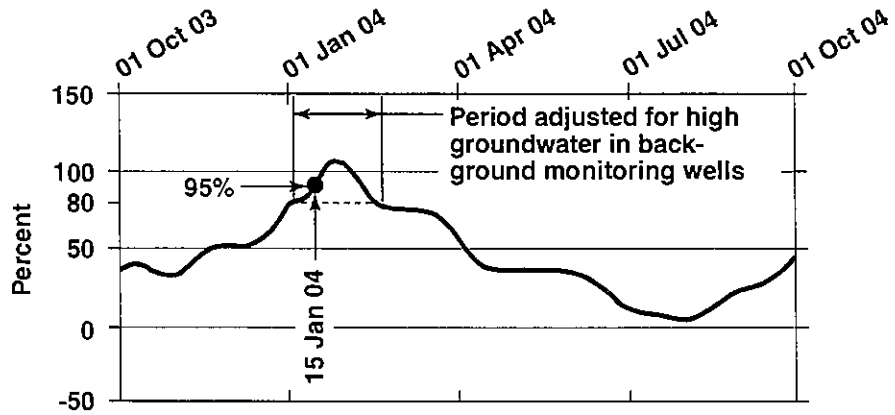


Figure C-7a. Average Normalized Data for All Background Monitoring Wells

On January 15, 2004, the average normalized data from the background monitoring well is 95%. At Seepage Monitoring Well A, the groundwater is at elevation -13.59 feet. To adjust Seepage Monitoring Well A's upper envelope for high groundwater conditions in the background monitoring wells:

1) Subtract 80% from the average for the background conditions:
$$95\% - 80\% = 15\%$$

2) Multiply the height of Seepage Monitoring Well A's envelope by the above percentage remainder:
$$[(-13.84) - (-14.96)] \times 15\% = 0.17 \text{ ft.}$$

3) Add the above product to the upper envelope:
$$-13.84 + 0.17 = 13.67 \text{ ft.}$$

4) The above value is the adjusted upperbound envelope for this particular well on the particular day.

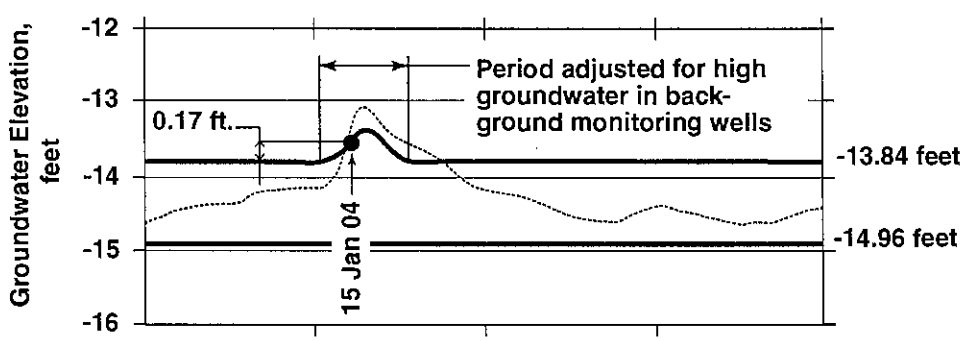
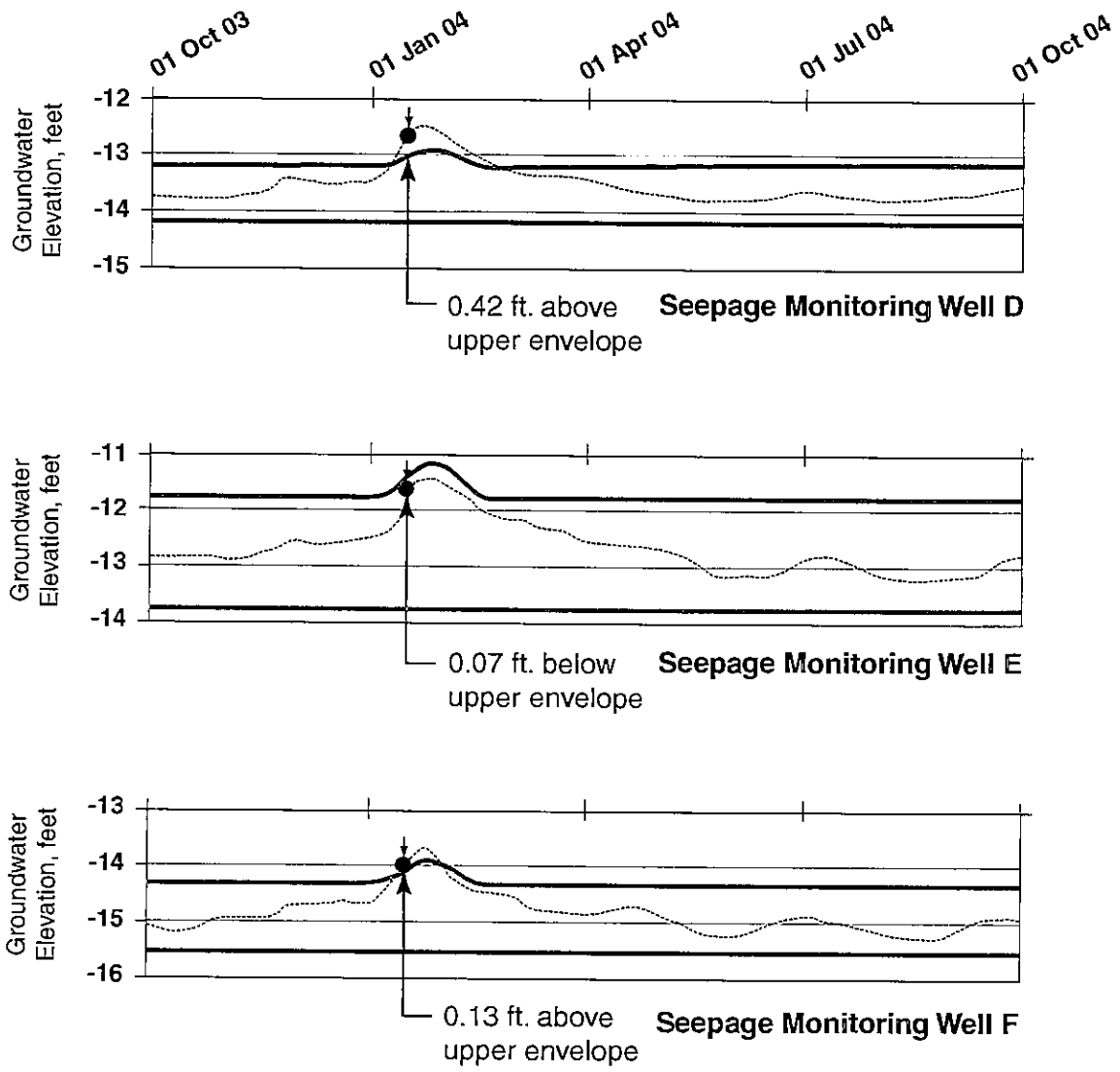


Figure C-7b. Upper Envelope of Seepage Monitoring Well A Corrected for High Groundwater in Background Monitoring Wells

Figure C-7
Correcting Upper Envelope for High Groundwater



Well No.	Groundwater Height Above Upper Envelope
D	0.42
E	-0.07
F	0.13
	0.48 ft ÷ 3 wells = 0.16 ft.

On January 15, 2004, the average groundwater height above upper envelopes for 3 wells is 0.16 ft. If the average is less than 0.25 feet above the upper envelope, the average groundwater level for these three wells is below the diversion suspension limit.

Figure C-8
Groundwater Evaluation Using Three Seepage Monitoring Wells

Agreement to Resolve Certain Delta Wetlands Permit Issues Between Delta Wetlands and California Urban Water Agencies

Exhibit D

AGREEMENT TO RESOLVE CERTAIN DELTA WETLANDS PERMIT ISSUES

This Agreement is entered into and effective this 9th day of October, 2000, by and between applicant **Delta Wetlands Properties** ("DWP") and the **California Urban Water Agencies** ("CUWA").

RECITALS

1. DWP proposes to develop a water storage project, known as the Delta Wetlands Project (hereinafter referred to as the "Project"), in the Sacramento-San Joaquin River Delta ("Delta"). The Project would divert and store water on two Delta islands (Bacon Island and Webb Tract, or "reservoir islands") and seasonally divert water to create and enhance wetlands and to manage wildlife habitat on two other islands (Bouldin Island and Holland Tract, or "habitat islands").

2. The intended purpose of the Project is to divert surplus Delta inflows, transferred water or banked water for later sale and/or release for Delta export or to meet water quality or flow requirements for the Delta.

3. DWP filed Water Right Applications 29061, 29062, 29063, and 29066 dated July 1, 1987 and Water Right Applications 30267, 30268, 30269, and 30270 dated July 21, 1993 ("Applications"), with the California State Water Resources Control Board ("SWRCB") for the Project.

4. In the pursuit of the necessary Water Right Permits for the Project, draft Environmental Impact Reports and Environmental Impact Statements ("Draft EIR/EIS Documents"), dated December 1990 and September 1995 have been prepared and circulated for public review. A Revised Draft EIR/EIS was released in May 2000. The lead agencies for said Draft EIR/EIS Documents are the SWRCB and the United States Army Corps of Engineers ("ACOE").

5. CUWA is an organization of member urban water agencies interested in protecting and improving the quality of water diverted from the Delta to their respective service areas. Two CUWA members, East Bay Municipal Utility District ("EBMUD") and Contra Costa Water District ("CCWD"), filed timely protests to the DWP water rights applications.

6. The SWRCB held a water rights hearing in mid-1997 ("SWRCB hearing") during which specific concerns were raised by CUWA and others regarding water quality and other issues.

7. CUWA is an interested party and presented testimony and evidence in the SWRCB hearing that the Project would injure CUWA member agencies unless certain mitigation measures were incorporated into the Project and its water rights permits to prevent or mitigate for such injuries.

8. Since the 1997 SWRCB hearing, other developments involving the Project and which are significant to CUWA have occurred, including release by the CALFED Bay-Delta Program ("CALFED") of its June 9, 2000, Framework for Action and August 28, 2000, Record of Decision for implementation of the CALFED Program which included a schedule for implementation of projects. In the context of this and other recent developments, CUWA, in conjunction with certain of its member agencies, has been working with DWP to address the issues raised by CUWA and others during the SWRCB hearing.

9. DWP, CUWA, and certain CUWA member agencies have participated in extensive efforts to develop a Water Quality Management Plan ("WQMP") for the Project to address the particular water quality issues regarding the Project that raise urban water quality concerns. The elements of the WQMP are intended to provide the urban water utilities with the necessary assurances that the Project will be operated in a manner that will ensure the protection of public health and long-term integrity of drinking water supplies diverted from the Delta, and that the Project, in conjunction with other components of the CALFED Bay-Delta Program, will result in net continuous improvement in Delta water quality.

10. DWP has executed Protest Dismissal Agreements with the two CUWA member agencies who filed protests, EBMUD and CCWD. Those Protest Dismissal Agreements provide certain assurances to EBMUD and CCWD which reflect the uniquely close geographic and hydraulic proximity of the Project reservoir islands to the CCWD intakes in the Delta and to EBMUD's Mokelumne River Aqueduct and to the migration corridor for the Mokelumne River anadromous fishery. The WQMP is incorporated by reference in the CCWD Protest Dismissal Agreement.

11. DWP is considering selling its interest in the Project to willing buyers, and certain agencies affiliated with the CALFED Bay-Delta Program are among the potential buyers which have expressed interest in possible acquisition of the Project. The State of California, through its Department of Water Resources ("DWR"), and the United States Bureau of Reclamation ("USBR") are potential purchasers of all or a part of the Project. Notwithstanding the foregoing, CUWA member agencies have not expressed an interest in acquisition of the Project, individually or through DWR or USBR, and have not determined that any benefits from the Project would accrue to them.

12. It is CUWA's position that State Water Project ("SWP") contractors should have an opportunity fully to comment on and contribute to decisions of DWR regarding allocation of the cost of DWR purchasing all or a part of Delta Wetlands' Project. Similarly, Federal Central Valley Project ("CVP") contractors should have an opportunity fully to comment on and contribute to decisions of USBR regarding allocation of the cost of USBR purchasing all or a part of the Project.

13. CUWA is also concerned that operation of any single unit or project, such as the Delta Wetlands Project, cannot meet all of CALFED's objectives, and completion and coordinated operation of several projects are essential to fully meet CALFED's goals of net continuous

water quality improvement, water supply reliability, ecosystem restoration and levee system stability.

14. CUWA is concerned that its member agencies could be adversely impacted if the Delta Wetlands Project were implemented in a way that was inconsistent with or adversely affected the schedules, as set forth in the CALFED August 28, 2000 Record of Decision, for CALFED water quality actions.

15. CUWA and DWP wish to resolve their differences with respect to the Project in a way that will protect CUWA's interests in water supply, water quality and environmental protection of the Delta insofar as said interests could be affected by the Project, and that would allow CUWA to withdraw its opposition to issuance of permits for the Project and not further dispute the adequacy of any EIR/EIS Documents for the Project.

16. The purpose of this Agreement is to set forth the terms and conditions upon which CUWA will withdraw its opposition to SWRCB issuance of permits for the Project, and not further dispute the adequacy of the environmental documents for the Project.

AGREEMENT

DWP and CUWA agree to the following terms and conditions:

A. DWP will implement and continue to operate according to the Delta Wetlands Water Quality Management Plan ("WQMP") attached hereto as Exhibit A and incorporated herein by this reference, which addresses the potential impacts of the Project on CUWA members' drinking water quality.

B. DWP and CUWA agree that Project operations will be coordinated with the operations of the CVP, SWP, and CALFED (and its successors). The intent of the coordination is:

1. Maintenance of water quality through the WQMP;

2. Achieving the CALFED goal of a net improvement in water quality through Project operations and coordinated implementation of CALFED Bay-Delta Program water quality components and actions;

3. Meeting water supply, water quality and environmental water requirements;

4. Protection of the fisheries resources in accordance with the SWP and CVP OCAP, and DWP aquatic species biological opinions, as they may be amended in the future;

5. Habitat development; and

6. Facilitating the use of the Project for a wide variety of project purposes.

C. During the period that the CALFED Bay-Delta Program as defined in the CALFED August 28, 2000 Record of Decision ("CALFED Program"), or its successor(s), is in effect, DWP will not seek State or Federal authorization, appropriation or any other form of funding for the purchase, lease, or any other form of total or partial acquisition of the Project, or for any studies regarding the Project, that will adversely affect or be in conflict with the CALFED Program or its schedule as defined in said Record of Decision. The purpose of this paragraph is to ensure that DWP, its successors and assigns, and the Project, do not adversely affect the funding, as determined by CALFED, for other elements of the CALFED Program.

D. DWP agrees that during the period that the CALFED Program, or successor Programs, is in effect, DWP shall not take any action which will adversely affect the schedule for implementation of the CALFED Program or any of its elements, and that, through the implementation of the WQMP, Project operations will not cause unmitigated adverse water quality impacts to drinking water users whose supply is diverted from the Delta. The purpose of this paragraph is to ensure that DWP, its successors and assigns, and the Project, do not adversely affect the schedule for other elements of the CALFED Program, or adversely affect the CALFED Program's goal of continuous improvement in water quality.

E. DWP and its agents shall, in all actions related to sales or other disposition of all or any part of the Project, use its best efforts to protect the interests of CUWA member agencies. To that end, in initiating negotiations for the sale of the Project to either DWR, USBR, or both, DWP shall use its best efforts to encourage those agencies to provide a process to allow SWP and/or CVP contractors to fully meet and confer directly with the DWR and/or USBR on cost allocation issues related to purchase of all or a part of the Project. Notwithstanding the foregoing, CUWA member agencies have not expressed an interest in acquisition of the Project, individually or through DWR or USBR, and have not determined that any benefits from the Project would accrue to them.

F. In the event that either DWR or USBR decline to meet and confer directly with SWP and/or CVP contractors on cost allocation issues, DWP agrees to provide an intensive alternative forum and process to facilitate full and complete analysis of allocation of any reimbursable and allocable costs related to the purchase by DWR and/or USBR of all or a part of the Project. DWP will pay all costs, up to a maximum of $200,000, of conducting a professionally facilitated review and assessment of all relevant cost allocation issues, and of preparing a detailed report on those issues.

G. CUWA shall withdraw its opposition to the issuance of water rights permits for the Project based on the terms and conditions of this Agreement and on the condition that the SWRCB expressly includes, in any water rights permits issued for the Project, the terms and conditions set forth in paragraphs A and B of this Agreement, or terms and conditions that CUWA and Delta Wetlands agree substantially conform to the terms and conditions of paragraphs A and B of this Agreement.

H. Whether or not the SWRCB includes the terms and conditions contained in this Agreement, Delta Wetlands and its successors shall be subject to and comply with the terms, conditions and requirements of this Agreement, including Exhibit A.

I. CUWA shall not further dispute the adequacy of the any EIR/EIS Documents for the Project in consideration of the protections provided by the WQMP.

J. DWP shall, as part of its direct case in the SWRCB hearings on DWP's applications for the Project, submit this Agreement as evidence and recommend to the SWRCB that it include this Agreement as a term of and condition to any water rights permit issued for the Project.

K. This Agreement shall be binding upon and inure to the benefit of the successors in interest and legal representatives of the respective parties. Whenever DWP is referred to in this Agreement, it applies to Delta Wetlands Properties as owner/operator of the Project, and to its successors and assigns, including but not limited to the State of California or its agencies, to the Federal government or its agencies, and to any other entity that might acquire all of or a partial interest in, or lease, or otherwise contractually agree to operate the Project.

L. All changes or modifications to this Agreement shall be in writing and signed by CUWA and DWP.

M. The signatories hereto represent that they are authorized to enter into this Agreement on behalf of the party for whom they sign. This document may be executed in duplicate originals.

DELTA WETLANDS PROPERTIES, an Illinois general partnership

By: KLMLP, L.P., a Delaware limited partnership, Special Partner

By: ZKS Real Estate Partners, LLC, a Delaware limited liability company, its authorized agent.

Dated: 10-9-00

By _____
Frederick L. Stephens, President

CALIFORNIA URBAN WATER AGENCIES

Dated: 10/9/00

By _____
Walter Bishop, Chairman of the Board

EXHIBIT A

WATER QUALITY MANAGEMENT PLAN

October 9, 2000

Preamble

Delta Wetlands Properties ("DW") proposed a water storage project on four islands in the Sacramento-San Joaquin Delta ("Delta"). The project would involve diverting and storing water on two of the islands (Bacon Island and Webb Tract, or "reservoir islands") and seasonally diverting water to create and enhance wetlands and to manage wildlife habitat on the other two islands (Bouldin Island and Holland Tract, or "habitat islands").

The purpose of the Delta Wetlands Project ("Project") is to divert surplus Delta inflows, transferred water or banked water for later sale and/or release for Delta export or to meet water quality or flow requirements for the Delta. To operate the Project, DW would strengthen the levees and install additional siphons and water pumps on the perimeters of the reservoir islands. The Project is undergoing environmental review (CEQA and NEPA), water rights permitting (State Water Resources Control Board), and an appraisal level study of the Project by the U.S. Bureau of Reclamation ("USBR").

California Urban Water Agencies[1] ("CUWA") and its member agencies have been participating in the public review of the Project since 1997 and are parties to the water rights proceedings for the Project. The primary focus of CUWA's participation in the review of the Project has been to seek a commitment from the Project proponents to minimize and mitigate drinking water quality impacts due to Project operations. Because of the close proximity of the reservoir islands to the Banks Pumping Plant, Tracy Pumping Plant, Contra Costa Canal at Pumping Plant #1, Contra Costa Water District's ("CCWD") Los Vaqueros intake on Old River and CCWD's Mallard Slough intake (hereafter "urban intakes"), CUWA is concerned that there is a potential for DW operations to result in increased total organic carbon ("TOC"), bromide, total dissolved solids ("TDS"), and chloride concentrations in urban water supplies.

In an effort to address CUWA's water quality concerns, Delta Wetlands Properties proposes to implement a water quality management plan ("WQMP"). The WQMP includes drinking water quality protection principles, an annual operating plan, general operating principles, a comprehensive monitoring program, screening procedures and operational constraints, and mitigation of water quality impacts. Collectively, the elements of the WQMP are intended to provide the urban water utilities with the necessary assurances that the Project will be operated in a manner that will ensure the protection of public health and long-term integrity of drinking water supplies diverted from the Sacramento-San Joaquin Delta.

The WQMP was developed through a negotiated process to resolve issues that are specific to the Project. The terms and conditions of the WQMP are intended to address the potential for injury to senior water rights holders associated with water quality degradation caused by the Project.

---

[1] All references to CUWA shall mean CUWA, its current member agencies and those member agencies of record as of the date of this agreement.

The impacts caused by the Project are unique because of its proximity to urban water agencies' intakes and the high rates of discharge from the reservoir islands. The Project, without the protections provided by the WQMP, has the potential to adversely impact human health by increasing disinfection by-products ("DBP") and to increase the overall cost of water utility operations. The Project could also lead to long-term degradation in drinking water quality. Because the WQMP includes distinctive features that are specific to DW, it should not be construed as setting a precedent that would be applicable to other dissimilar projects subject to State Water Resources Control Board jurisdiction.

A. Drinking Water Quality Protection Principles

The Project will adhere to the drinking water quality protection principles described below through the implementation of the terms and conditions of this WQMP.

1. Project operations shall cause no adverse health impacts to water users;

2. Project operations shall not cause nor contribute to non-compliance with current or future drinking water regulations;

3. Project operations shall cause no increases in the cost of water treatment or operations;

4. Project operations shall contribute to CALFED's progress toward achieving continuous improvement of Delta drinking water source quality; and

5. Project operations shall minimize and mitigate for any degradation in the quality of drinking water supplies.

B. Water Quality Management and Action Board and Annual Operating Plan

The Water Quality Management and Action Board and the Annual Operating Plan outlined below are intended to support the administration and implementation of the WQMP.

1. Prior to initiating or continuing Project operations, a Water Quality Management and Action Board ("WQMAB") shall be appointed to oversee the implementation of the WQMP for the Project subject to the procedures, duties and requirements set forth in Attachment 1.

2. Prior to February 15 of each year, DW will propose an Annual Operating Plan for approval by the WQMAB. The Annual Operating Plan will be updated monthly and coordinated with Central Valley Project, State Water Project, and CCWD operations. The Annual Operating Plan will include:

    a. Schedules and estimated quantities for diversions to the Project islands and discharges from the Project islands.

    b. Water quality goals and objectives, including the estimated concentration of TOC, bromide, chloride, and TDS for the diversions to the Project islands and discharges from the Project islands.

c. An estimate of the projected change in the concentration of TOC, bromide, chloride, and TDS at the urban diversion locations due to scheduled Project operations.

d. Maximum allowable concentrations of the water quality constituents of concern (TOC, bromide, TDS, and chloride) for water stored on the reservoir islands, above which it will be necessary for DW to pursue remedial actions pursuant to the Emergency Operating Plan. The maximum allowable concentrations are upper limits above which discharge of water from the reservoir islands may cause a violation of one or more of the drinking water quality protection principles.

e. An Emergency Operating Plan describing remedial actions to be taken by DW in the event the water stored on the reservoir islands exceed the maximum allowable concentrations for the constituents of concern, including a procedure for discharge of the water from the reservoir islands that will minimize the potential for impacts to urban water utilities.

f. A schedule for habitat island operations, including diversion and discharge rates.

g. A schedule for reservoir island operations for non-storage periods.

h. A description of the monitoring program, hydrodynamic models, and particle-tracking models pursuant to Section D.

i. A description of mitigation measures to be implemented by DW to offset any long-term net increase in TOC, TDS, bromide or chloride loading pursuant to Section F.

C. General Operating Principles

The general operating principles outlined below are intended to support implementation of the WQMP.

1. To maintain low TOC, bromide and salinity levels to the fullest extent practicable, DW will:

   a. Avoid practices that will result in high TOC productivity during non-storage periods;

   b. Avoid diversions to storage during peak TOC periods;

   c. Avoid diversions to storage during high bromide and high salinity periods; and

   d. Manage vegetative growth on the reservoir islands to minimize TOC production.

2. To avoid degradation in water quality at the urban intakes in the Delta, DW will develop operational procedures to:

   a. Reduce the rate of discharge from the reservoir islands as appropriate;

b. Coordinate discharges between reservoir islands; and

c. Adjust discharges for exports in accordance with Delta hydrodynamic (e.g., tides, pulse flows).

3. To avoid excessive TOC, bromide and salinity levels, DW will:

a. Pursue remedial actions or acquire offsets before initiating further diversions to storage if TOC, bromide or salinity concentrations on reservoir islands regularly exceed 80% of the maximum allowable concentrations set forth in the Annual Operating Plan.

D. Comprehensive Monitoring Program

The comprehensive monitoring program outlined below will be developed and in place prior to initiating Project operations. The monitoring program provides for the collection of data to support the screening of Project operations and for imposition of operational constraints pursuant to Section E and the identification of mitigation requirements pursuant to Section F.

1. DW will conduct real-time water quality monitoring on the reservoir and habitat islands and in the Delta channels at the discharge locations of the reservoirs and habitat islands prior to and during all discharge periods.

2. The State Department of Water Resources ("DWR"), USBR and CCWD will provide real-time water quality monitoring data at urban intakes in the Delta.

3. The owners of urban water treatment facilities will provide water quality monitoring and operational data at water treatment plants.

4. The water quality monitoring program shall include quality assurance and quality control provisions.

5. Monitoring parameters will include TOC, bromide, TDS, chloride, UVA, DO, turbidity, and temperature.

6. DW will post monthly summaries of the data collected pursuant to subsections 1 through 3 above on the DW web site or adopt an alternative means of disseminating this information to the WQMAB and interested parties that provides an equivalent degree of accessibility.

7. Hydrodynamic and particle-tracking models will be used to predict both baseline conditions (without Project) and real-time changes at the urban intakes in the Delta prior to, during and after a Project operation. DW will submit a proposed monitoring and modeling program for approval by the WQMAB prior to operating the reservoir islands with annual updates and approvals of the modeling program thereafter (through the Annual Operating Plan review process) to reflect advances in science and technology.

Water quality constituent predictions required by the WQMP shall be calculated in accordance with the initial models and modeling assumptions set forth in Attachment 3, unless otherwise approved by the WQMAB.

E. Screening Procedures and Operational Constraints to Prevent Short-Term Impacts

The process outlined below for screening of Project operations and imposition of operational constraints is intended to prevent short-term impacts to urban water utilities and to ensure adherence to the drinking water quality protection principles 1 through 3 set forth in Section A.

1. Operational screening criteria will be used to identify Project operations that may threaten adherence to one or more of the drinking water quality protection principles. The operational screening criteria are set forth in Attachment 2 and implemented as described below.

2. Prior to DW initiating each diversion to the reservoir islands and each discharge from the reservoir islands and weekly thereafter during continuing diversions and discharges, the hydrodynamic and particle-tracking models will be used to predict whether Project operations (including operations of the habitat islands) are likely to exceed one or more of the operational screening criteria at the urban intakes in the Delta. (See Attachment 2, criteria A1, A2, B1, B2, C1, and C2.)

3. If the model output indicates that Project operations may exceed one or more of the operational screening criteria at one or more of the urban intakes in the Delta, DW will conduct further studies (prior to initiating a diversion to the reservoir islands or a discharge from the reservoir islands) to determine whether one or more of the drinking water quality protection principles would be threatened at an urban water treatment plant. (See Attachment 2, criteria A3, B3, and B4.)

4. If, upon further study, it appears that Project operations may threaten one or more of the drinking water protection principles at an urban water treatment plant, a determination will be made whether the threat would be offset by a Project-induced water quality or water supply improvement. If the owner of the impacted water treatment plant agrees that the threat would be offset or agrees to waive its right to protection under the WQMP, DW may initiate the diversion to the reservoir islands or discharge from the reservoir islands.

5. If Project operations threaten a drinking water quality protection principle at the water treatment plant without offsetting benefits and the treatment plant owner has not waived its right to protection, Project operations will be reduced, rescheduled or otherwise constrained as necessary to prevent the impact from occurring.

6. If an urban water treatment plant owner presents a complaint to DW and the WQMAB that: (1) a violation of a drinking water quality protection principle has occurred or is likely to occur in the absence of remedial action, or (2) one of the Project screening criteria set forth in Attachment 2 has been exceeded or is likely to be exceeded in the absence of remedial action, and (3) the WQMAB finds that the complaint has sufficient

merit to warrant an investigation; the WQMAB shall proceed with an investigation of the complaint. Throughout the duration of the WQMAB's investigation of the complaint and until the matter is resolved by the WQMAB, Project operations shall be restricted such that the maximum discharge rate from a reservoir island shall not exceed the schedule set forth in Table 1. Alternatively, the Project operations may proceed pursuant to the terms of an Emergency Operating Plan that has been approved by the WQMAB. DW shall cooperate with the WQMAB throughout the duration of the investigation.

7. If the WQMAB pursuant to the investigations set forth in paragraph E.6 make a finding that monitoring, modeling, and/or operational constraints fail to prevent a violation of a drinking water quality protection principle resulting from Project operations, or fail to prevent an exceedance of one of the operational screening criteria set forth in Attachment 2 due to Project operations, the WQMAB shall require DW to initiate emergency operations or take remedial actions to correct the problems.

Table 1[1]

TOC Concentration on Bacon Island Minus That of Ambient Water (mg/L)[2]	Maximum Discharge Rate from Bacon Island (cfs)[2]	TOC Concentration on Webb Tract Minus That of Ambient Water (mg/L)	Maximum Discharge Rate from Webb Tract (cfs)[2]	Chloride Concentration on a Reservoir Island (mg/L)	Maximum Combined Discharge Rate from Bacon Island and Webb Tract (cfs)[2]
0 to 1.0	1,500	0 to 3.0	1,500	0 to 50	3,000
1.1 to 2.0	1,250	3.1 to 4.0	1,250	51 to 70	2,500
2.1 to 3.0	1,000	4.1 to 5.0	1,000	71 to 90	2,000
3.1 to 4.0	750	5.1 to 6.0	750	91 to 110	1,500
4.1 to 5.0	500	6.1 to 7.0	500	111 to 130	1,000
5.1 to 6.0	250	7.1 to 8.0	250	131 to 150	500
6.1 to 7.0	125	8.1 to 9.0	125	151 to 170	250
Greater than 7.0	40	Greater than 9.0	40	171 to 250	80

Table 1 footnotes:

[1] The restrictions on discharges from the reservoir islands contained in Table 1 for various concentrations of TOC and chloride are not applicable if the TOC and chloride concentrations on a reservoir island are less than or equal to the average TOC and chloride measured in the channels adjacent to the reservoir islands for the 7-day period prior to initiating the discharge.

[2] The maximum discharge rate means the average discharge rate over a 14-day period or the duration of the discharge, whichever time period is less. The maximum discharge rate shall be further constrained, as necessary, to limit the total contribution from the reservoir islands at the urban intakes to 25% of the combined export pumping at the Banks and Tracy pumping plants.

F. Mitigation of Long-Term Water Quality Impacts.

The process outlined below for mitigation of long-term water quality impacts due to Project operations is intended to prevent long-term impacts to urban water utilities and ensure adherence to the drinking water quality protection principles 3 and 4 set forth in Section A. Should Project operations produce a long-term net increase in TOC, TDS, bromide or chloride loading in the urban diversions, mitigation may be necessary, as described below:

1. During the course of the 12-month operating plan, DW shall maintain a running account of the changes in TOC, TDS, bromide and chloride in the water diverted from the Delta for urban use due to Project operations.

2. Once every three years, DW shall submit an accounting of the net increase or decrease in TOC, TDS, bromide and chloride loading in the water diverted from the Delta for urban use due to Project operations (including habitat island operations).

3. DW shall be required to acquire offsets or otherwise mitigate 150% of the net increase in TOC, TDS, bromide and chloride loading greater than 5% in the urban diversions due to Project operations.

4. DW must acquire the offsets or complete the mitigation at its expense within 24 months after the submission of the accounting set forth in 2 above. Any offset or mitigation that is provided in the current accounting period that is due to a mitigation requirement that accrued during a previous accounting period shall be excluded from the calculation of the net increase for the current accounting period.

5. In recognition of initial Project start-up, long-term mitigation requirements for TOC loading shall be waived for the first year of reservoir operation; however, the screening procedures and operational constraints to prevent short-term impacts set forth in Section E shall still apply.

ATTACHMENT 1
WATER QUALITY MANAGEMENT AND ACTION BOARD

1. **Purpose**: A Water Quality Management and Action Board ("WQMAB"), or an equivalent mutually acceptable authority, shall be appointed to oversee the implementation of the Water Quality Management Plan ("WQMP") for the Delta Wetlands Project ("Project").

2. **Members**:

   a. **Qualifications**: The three members and three alternates shall be registered professional engineers, public health professionals or scientists possessing a thorough understanding of Delta operations and recognized for their expertise in organic and inorganic water chemistry and drinking water treatment.

   b. **Appointment Process**: The State Water Resources Control Board ("SWRCB"), California Urban Water Agencies ("CUWA"), and Delta Wetlands Properties ("DW") shall each appoint one member and one alternate. Each prospective member of the WQMAB shall be required to disclose any past or current conflicts of interest that may affect their ability to serve as impartial members of the WQMAB. Appointment of prospective members with past or current conflicts of interest must be approved by the mutual consent of CUWA and DW. In the event that the SWRCB does not appoint its member or alternate to the WQMAB, CUWA and DW shall appoint the SWRCB's member or alternate member. Each of the WQMAB members shall be appointed for a term of four years. At the end of the 4-year term, the same selection process will be used to select the new WQMAB.

3. **Term**: The WQMAB shall be established prior to the first diversions to storage on Bacon Island or Webb Tract ("initial operations") and shall continue thereafter for the duration of Project reservoir operations.

4. **Compensation**: Members of the WQMAB are to be compensated by DW for their time on an hourly basis. Such costs, including costs of reports which may be prepared and studies which may be undertaken by the WQMAB shall be part of the annual operation and maintenance costs of the Project.

5. **Duties**:

   a. The WQMAB shall serve as a neutral water quality advisory panel, hearing and investigating formally identified problems purportedly caused by Project reservoir operations, including but not limited to nonconformance with the Annual Operating Plan and violations of the Drinking Water Quality Protection Principles.

   b. Prior to initial operations and annually thereafter, DW shall submit a proposed Annual Operating Plan for approval by the WQMAB pursuant to Section B of the WQMP.

i. Prior to approving the Annual Operating Plan, the WQMAB shall provide an opportunity to comment on the draft Annual Operating Plan to the SWRCB, CUWA, and all other parties who have notified the WQMAB of their interest to comment on the draft Annual Operating Plan ("Interested Parties").

ii. In the event of any objection by CUWA or an Interested Party, the WQMAB may only approve the Annual Operating Plan after holding a noticed hearing on the proposed operating plan.

iii. If the WQMAB approves the Annual Operating Plan, the WQMAB shall immediately so advise DW.

iv. If the WQMAB does not approve an Annual Operating Plan, the WQMAB shall, within 10 days, provide a report explaining its decision to DW and to the Executive Director of the SWRCB. DW may provide a response to the WQMAB report to the Executive Director.

v. The issue of adequacy of the Annual Operating Plan will be decided by the Executive Director of the SWRCB as soon as possible upon receipt of such report.

vi. If the WQMAB does not approve the Annual Operating Plan for any reason, DW may continue its reservoir operations pursuant to the previously approved Annual Operating Plan or pursuant to paragraph E.6 of the WQMP, if applicable.

c. DW shall make available water quality monitoring and modeling data to the WQMAB pursuant to Sections D and E of the WQMP.

d. During the first two years following initial operations, the WQMAB shall review water quality monitoring data at each stage of filling and discharge of the reservoir islands.

e. At the end of the third year of operations and every three years thereafter, DW shall submit to the WQMAB an accounting of the net increase or decrease in water quality parameters of concern in the water diverted from the Delta for urban use due to Project operations pursuant to Section F of the WQMP. Prior to initiating the fourth year of operations and each year thereafter, the Annual Operating Plan shall include a plan to offset or otherwise mitigate any net increase in water quality parameters of concern pursuant to Section F of the WQMP.

f. If the WQMAB determines that the Project operations are not in conformance with the Annual Operating Plan, the WQMAB shall require the permittee to initiate emergency operations or take remedial actions to correct problems as provided for in paragraph E.7 of the WQMP.

g. The terms of the WQMP may be adjusted over time by the SWRCB as set forth below. The SWRCB reserves jurisdiction over changes in the WQMP to coordinate or modify its terms for the protection of other legal users of water and the public interest as future

conditions may warrant. The SWRCB delegates authority to the Executive Director of the SWRCB to take actions under this reservation of jurisdiction as set forth below.

i. During the third year of Project operations, the WQMAB shall review the WQMP to determine if changes in any of the WQMP terms are advisable. In its review, the WQMAB shall examine actual operation of the Project to date and any adverse effects of Project reservoir operations, including impacts to urban water agencies, degradation of drinking water quality, overall progress toward achieving continuous improvement of drinking water source quality, and any recent changes in state and federal drinking water regulations. The WQMAB will base each of its recommended changes to WQMP terms, if any, on its independent, professional judgment. At the conclusion of its review, the WQMAB shall issue a written list of its recommended changes, if any. The list shall be sent by the WQMAB to the SWRCB, DW, CUWA, and all other Interested Parties.

ii. If no party raises a reasonable objection to a change recommended by the WQMAB within 30 days of service of any proposed change, then the Executive Director of the SWRCB may approve the change without the need for a comment period or hearing. In the event of any objection, the SWRCB may only approve the change after it provides notice of and an opportunity to comment on the proposed change. If requested by an DW, CUWA, or any Interested Party, the SWRCB may hold a hearing on the proposed change.

h. After its initial 3-year review of the WQMP as set forth above, the WQMAB may thereafter periodically review and change the terms of the WQMP so long as the SWRCB review and approval process set forth above is followed.

ATTACHMENT 2
OPERATIONAL SCREENING CRITERIA

Operational Constraints

The operational screening criteria outlined in this attachment were developed to support the process outlined in Section E of the Water Quality Management Plan ("WQMP") for screening of Delta Wetlands Project ("Project") operations and imposition of operational constraints. This process is intended to support Delta Wetlands' ("DW") adherence to the drinking water quality protection principles 1 through 3 described in Section A of the WQMP.

These screening criteria are based on existing state and federal standards for disinfection by-products and their precursors. Should drinking water DBPs, contaminants or precursors, or any other drinking water contaminants be further regulated under state or federal law, the WQMAB shall recommend that the SWRCB amend the screening criteria to ensure that the intent of the drinking water quality protection principles continues to be met.

Evaluation of Project operations using these screening criteria will be based on real-time field measurements and computer modeling results, both of which are subject to uncertainties. For purposes of determining whether the Project has caused an exceedance of one or more of the operational screen criteria, an uncertainty of ±5% of the screening criteria will be assumed.[2] Should greater precision in measurements and calculations be developed, the improved level of confidence will be used as appropriate for each individual parameter.

An exceedance of the operational screening criteria set forth in Sections A, B and C below shall be calculated as a 14-day average, or the average for duration of the discharge, whichever time period is less.

A. TOC Loading

The criteria below will be used in the screening procedures set forth in paragraphs E2 and E3 of the WQMP and in the imposition of operational constraints in paragraph E5 of the WQMP. The criteria are intended to prevent an impact due to Project-related TOC loading that may cause an increase in water treatment costs.

1. Project operations that cause an increase in TOC of more than 1.0 mg/L at the urban intakes; or

2. Project operations that cause TOC concentrations at the urban intakes to exceed 4.0 mg/L; and

[2] An uncertainty of ±5% shall mean that an exceedance of an operational screen criteria does not occur until the Project causes the following values to be exceeded: condition A.1 not applicable; conditions A.2 and A.3 = 0.2 mg/L TOC; conditions B.1 and B.3 = 3.2 μg/L TTHM; conditions B2 and B4 = 0.4 μg/L bromate; conditions C1 and C2 not applicable.

3. Project operations that cause TOC concentrations at a water treatment plant to exceed 4.0 mg/L.

B. DBP Formation

The criteria below will be used in the screening procedures set forth in paragraphs E.2 and E.3 of the WQMP and in the imposition of operational constraints in paragraph E.5 of the WQMP. The criteria are intended to prevent an impact due to Project-related DBP precursor loading that may cause health impacts to water users or may cause or contribute to a water treatment plant violation of a health regulation:

1. Project operations that cause or contribute to modeled Total Trihalomethanes ("TTHM") concentrations in drinking water in excess of 64 μg/L, as calculated in the raw water of an urban intake in the Delta;
2. Project operations that cause or contribute to modeled bromate concentrations in drinking water in excess of 8 μg/L, as calculated in the raw water of an urban intake in the Delta;
3. Project operations that cause or contribute to predicted TTHM concentrations in drinking water in excess of 64 μg/L, as calculated from measurements at the outlet of a water treatment plant; or
4. Project operations that cause or contribute to predicted bromate concentrations in drinking water in excess of 8 μg/L, as calculated from measurements at the outlet of a water treatment plant.

C. Salinity Impacts Resulting from Project Operations

The criteria below will be used in the screening procedures set forth in paragraphs E.2 and E.3 of the WQMP and in the imposition of operational constraints in paragraph E.5 of the WQMP. The criteria are intended to promote Project operations that select the highest water quality for diversion to the islands and minimize salinity impacts associated with discharges from the reservoir islands:

1. Project operations that cause an increase in salinity of more than 10 mg/L chloride at one or more of the urban intakes; or
2. Project operations that cause or contribute any salinity increase at the urban intakes in the Delta exceeding 90% of an adopted salinity standard (e.g., Rock Slough chloride standard defined in SWRCB Decision 1641).

ATTACHMENT 3
INITIAL MODELING ASSUMPTIONS

The screening procedures and long-term mitigation requirements of the Water Quality Management Plan ("WQMP") require several analytical tools to predict water quality and disinfection by-products ("DBP") changes or Total Trihalomethanes ("TTHM"). Three models will be required to implement the WQMP: 1) a water quality model, 2) a particle-tracking model, and 3) a water treatment model for DBPs. The Annual Operating Plan sets forth periodic update and approval requirements of the final modeling program; however, the initial modeling assumptions included in the evaluations for the WQMP have been included below:

1. Initial modeling assumptions
   a. Baseline hydrology: existing conditions and short-term forecasts (50% exceedence) of future conditions
   b. Baseline water quality: Fischer Delta Model Version 10 with real tide simulations

2. Initial land use assumptions
   a. No-Project irrigation and drainage quantities: DWR DICU historic rates
   b. No-Project agricultural drainage quality:
      i. Ag bromide to channel bromide ratio (Ag/Ch Ratio) = max ($65.597 * Ch^{-0.6436}$ or 125%)
      ii. Ag TOC = Average of west and south Delta MWD assumptions

3. TTHM Model (Malcolm Pirnie)

$$TTHM = 7.21 \times TOC^{0.004} \times UVA_{254}^{0.534} \times (Cl_{DOSE} - 7.6 \times NH_3N)^{0.224} \times Cl_{TIME}^{0.255} \times (Br+1)^{2.01} \times (pH-2.6)^{0.719} \times T^{0.48}$$

Where:

TOC = raw water TOC (mg/l) x (0.75 if TOC<4 or 0.65 if TOC>4)

$UVA_{254} = 0.033 \times TOC + 0.010$

Cl_{DOSE} (Cl:TOC ratio) = 1.0

NH_3N = Not Applicable

Cl_{TIME} (contact time) = 1.0 hour

Br = raw water bromide (mg/l)

pH = 7.0

T = Monthly average raw water temperature (9-24°C)

4. Bromate Model (Ozekin)

$BRM = [1.63\ E\text{-}06 \times TOC^{-1.26} \times pH^{5.82} \times O3_{DOSE}^{1.57} \times Br^{0.73} \times O3_{TIME}^{0.28}] \times BRMCF$

Where:

TOC = raw water TOC (mg/l) x (0.75 if TOC<4 or 0.65 if TOC>4)

pH = 7.0

$O3_{DOSE}$ (O3:TOC ratio) = 0.6

Br = raw water bromide (μg/l)

$O3_{TIME}$ (contact time) = 12 minutes

BRMCF (bromate correction factor) = 0.56

Protest Dismissal Agreement Between Contra Costa Water District and Delta Wetlands Properties

CCWD EXHIBIT 25

before the

STATE WATER RESOURCES CONTROL BOARD

STATE OF CALIFORNIA

in the

WATER RIGHTS HEARING FOR THE DELTA WETLANDS PROJECT

October 10-12, 2000

on behalf of the

CONTRA COSTA WATER DISTRICT

PROTEST DISMISSAL AGREEMENT BETWEEN CONTRA COSTA WATER DISTRICT AND DELTA WETLANDS PROPERTIES

PROTEST DISMISSAL AGREEMENT
BETWEEN
CONTRA COSTA WATER DISTRICT AND
DELTA WETLANDS PROPERTIES

This Protest Dismissal Agreement is entered into and effective this 9th day of October, 2000, by and among Applicant Delta Wetlands Properties ("DWP") and Protestant Contra Costa Water District ("CCWD" or "District").

RECITALS

WHEREAS:

1. DWP proposes to develop a water storage project, known as the Delta Wetlands Project (hereinafter referred to as the "Project"), in the Sacramento-San Joaquin River Delta ("Delta"), on four islands, all of which are located within the statutory boundary of the Sacramento-San Joaquin River Delta, as defined in Water Code Section 12220, shown on the map attached hereto as Exhibit A.

2. The Project includes diversion and storage of water on two of the Delta islands (Bacon Island and Webb Tract, or "reservoir islands") and seasonal diversion of water to create and enhance wetlands and to manage wildlife habitat on the other two islands (Bouldin Island and Holland Tract, or "habitat islands"), as described in the Water Rights Applications.

3. In pursuit of the Project, DWP filed Water Right Applications 29061, 29062, 29063, and 29066 dated July 1, 1987 and Water Right Applications 30267, 30268, 30269, and 30270 dated July 21, 1993 ("Applications"), with the California State Water Resources Control Board ("SWRCB").

4. CCWD asserts that it is a legal user of water from the Delta and is located entirely within an area enclosed by the statutory boundaries of the Delta or an area immediately adjacent thereto which can conveniently be supplied with water therefrom.

5. CCWD diverts water from the Delta, pursuant to direct diversion and storage rights, for beneficial uses including, but not limited to, municipal, industrial, agricultural, and recreation purposes, under its Water Right License No. 3167 for Mallard Slough, and Water Right Permits for Mallard Slough (No. 19856), Kellogg Creek (No. 20750) and Los Vaqueros Reservoir (No. 20749).

6. CCWD also diverts and rediverts water from the Delta at Rock Slough, Mallard Slough, and Old River for beneficial uses including, but not limited to, municipal, industrial, and agricultural purposes under a Water Service Contract (Amendatory Contract Number I75r-3401 dated May 26, 1994) with the United States Bureau of Reclamation ("USBR") for water from the Central Valley Project ("CVP"). CCWD's CVP contract was further amended on February 7, 2000 (Amended Contract Number I75r-3401A).

7. CCWD owns and operates the Los Vaqueros Project, which includes the Old River Intake, the 100,000 acre-foot Los Vaqueros Reservoir, pumping facilities and pipelines, and which is operated to store water for the purposes of improving CCWD's water quality and emergency supplies while providing net environmental benefits.

8. On January 21, 1988 and October 4, 1993, CCWD filed timely water rights protests to the Applications filed by DWP for the Project, alleging injuries to CCWD, its water rights and the quality of water CCWD diverts from the Delta and based on environmental considerations. CCWD's protests stated that "The Protest could be dismissed provided that conditions that will provide positive assurance that the applicant's project will not adversely affect the quality or quantity of the Protestant's water supplies, or adversely affect the Protestant's ability to meet environmental conditions and mitigation requirements of the Los Vaqueros Project. Conditions for dismissal must also include assurance that operation of applicant/petitioner's project will not adversely affect the water supply operations of the CVP in a manner which would result in impairment of the quantity or quality of water supplied to Protestant by the CVP."

9. Because of the close geographic and hydraulic proximity of the reservoir islands to CCWD's intakes in the Delta, Project operations could lead to increased total organic carbon (TOC), bromide, total dissolved solids (TDS) and/or chloride concentrations in CCWD's drinking water supply.

10. CCWD asserts that, as a legal user of water, it would be injured if water intended for export from the Delta were diverted to storage on the reservoir islands outside of the export/inflow ratio specified in the SWRCB's May 1995 Water Quality Control Plan and Revised Water Rights Decision 1641.

11. Failure of the levee system on DWP islands or neighboring islands as a result of Project operations could, because of the close geographic and hydraulic proximity of the reservoir islands to CCWD's intakes in the Delta, impact CCWD's water quality and water supply by causing increased seawater intrusion, and/or releasing poorer quality stored water from the Delta Wetlands islands into the Delta.

12. An appropriate agreement is necessary to provide protective measures and the requisite degree of certainty regarding the construction, operation, and maintenance of the Project, so that such a sale to another party would not result in the Project being constructed, operated and maintained in a way that would injure CCWD, CCWD's water rights and water quality, and disrupt the operation of the Los Vaqueros Project.

13. CCWD and DWP wish to resolve their differences with respect to the Project in a way that will permanently protect CCWD's interests in water supply, water quality and environmental protection of the Delta insofar as said interests could be affected by the Project, and that would allow withdrawal of the water rights protests CCWD has filed, avoid further dispute as to the adequacy of the Final Environmental Impact Reports and Environmental Impact Statements for the Project, and avoid any other legal, regulatory, or other challenges by CCWD to Project construction, operation, or sale.

14. CCWD, DWP and the California Urban Water Agencies ("CUWA") have participated in extensive efforts to develop a Water Quality Management Plan ("WQMP") for the Project to address the particular water quality issues regarding the Project that raise urban water quality concerns. The elements of the WQMP are intended to provide the urban water utilities with the necessary assurances that the Project will be operated in a manner that will ensure the protection of public health and long-term integrity of drinking water supplies diverted from the Sacramento-San Joaquin Delta, and that the Project, in conjunction with components of the CALFED Bay-Delta Program, will result in net continuous improvement in Delta water quality.

15. CUWA and DWP have executed that certain Agreement to Resolve Certain Delta Wetlands Permit Issues, dated October 9, 2000, which incorporates the WQMP and provides CUWA member agencies, including CCWD, certain other guarantees regarding the avoidance of conflicts with the schedule and funding of CALFED programs, and regarding cost allocation issues should DWP be sold.

16. The intent of this Agreement is to prevent the Project from adversely impacting CCWD. CCWD asserts that because the distinctive features of the Project are unique, this Agreement should not be construed as setting a precedent that would necessarily be applicable to dissimilar projects, or to other actions or activities related to Delta water quality or water supply matters.

AGREEMENT

NOW, THEREFORE, in consideration of the foregoing and the mutual and dependent covenants hereinafter set forth, the parties mutually agree as follows:

1. The purpose of this Agreement is to set forth the terms and conditions that if agreed to and adhered to by DWP, its successors and assigns, shall cause CCWD to withdraw its protests against the Water Rights Applications for the Project. CCWD shall withdraw its protest of the Water Rights Applications for the proposed Project based on the terms and conditions of this Agreement and on the condition that the SWRCB expressly includes, in any water rights permits issued for the Project, the terms and conditions set forth in paragraphs 2, 3, 4, 5 and 6 below.

2. DWP will implement and continue to operate the Project according to the WQMP, attached hereto as Exhibit B and incorporated herein by this reference, which addresses the potential impacts of both diversions to and discharges from the DWP islands.

3. DWP agrees that, in order to protect CCWD's water quality, DWP will operate the Project subject to the following restrictions:

   a. Project diversions shall not exceed 1,000 cubic feet per second ("cfs") when the 14-day running average of X2 is greater than 80 km, nor exceed 500 cfs if the 14-day running average of X2 exceeds 81 km. The location of X2 shall be defined as the average daily location of a surface water electrical conductivity (EC) of 2.64 mmhos/cm, determined by interpolating the average daily surface EC measurements at existing Bay-Delta monitoring stations. Should this traditional methodology be replaced, superseded, or become otherwise unavailable, the Project shall follow whatever equivalent practice is developed, subject to mutual agreement.

   b. The Project diversions from the Delta to storage shall not exceed twenty-five percent (25%) of Net Delta Outflow, which Index shall be calculated as defined in the SWRCB May 1995 WQCP as it may be amended or revised from time to time, provided that the Net Delta Outflow shall include in its calculation the diversions of the Project, nor shall Project diversions from the Delta to storage exceed fifteen percent (15%) of Net Delta Outflow in the months of January, February and March, nor shall any diversions to storage be made in April and May, nor shall Project diversions shift the location of X2 by more than 2.5 kilometers ("km") during the months of October, November, December, January, February and March. The resultant shift in X2 shall be determined by a comparison of the modeled estimates of the X2 location, with and without the Project, using a mathematical model, e.g., Kimmerer and Monismith equation.

   c. The Project shall not cause at any time an increase in chloride concentration at any of CCWD's intakes of more than 10 milligrams/liter (mg/l).

   d. The Project shall not undertake its initial diversions to storage for the current water year (commencing October 1) until X2 has been west of Chipps Island for a period of ten (10) consecutive days.

4. DWP agrees that the Project shall not divert to storage if the Delta is in excess conditions and such diversions cause the location of the 14-day running average of X2 to shift upstream (east) such that X2 is:

   a. East of Chipps Island (75 river kilometers upstream of the Golden Gate Bridge) during the months of February through May, or

   b. East of Collinsville (81 kilometers upstream of the Golden Gate Bridge) during the months of January, June, July, and August, or

   c. During December, east of Collinsville and Delta smelt are present at Contra Costa Water District's point of diversion under Water Rights Permits 20749 and 20750.

5. DWP and CCWD agree that any diversion by the Project to storage that causes the Delta to change from excess to balanced conditions shall be junior in priority to Permits 20749 and 20750 of the Contra Costa Water District. Excess conditions and balanced conditions shall be determined by the State Department of Water Resources and the USBR.

6. Because of the close geographic and hydraulic proximity of the reservoir islands to CCWD's intakes in the Delta and CCWD's special concerns regarding salinity, 30 days prior to submitting the annual operating plan as set forth in the WQMP, DWP will provide CCWD a preliminary review draft of the WQMP annual operating plan for review and comment and Delta Wetlands will fully consider in good faith CCWD's comments before submitting it for approval as provided by the WQMP. CCWD will provide its comments within fifteen (15) days and Delta Wetlands shall submit CCWD's comments with its final annual operating plan. Monthly updates to the annual operating plan will be submitted to CCWD in draft form fourteen (14) days in advance of submission to the Project Water Quality Management and Action Board and CCWD will provide comments within seven (7) days.

7. Whether or not the SWRCB includes the terms and conditions set forth in the Protest Dismissal Agreement, DWP shall be subject to and comply with the terms, conditions, and requirements of this Agreement.

8. CCWD and DWP agree that protection of Delta levee systems, including the levee systems on the four islands that are part of the Project, is necessary to protect Delta water quality, and such protection is one purpose of the Protest Dismissal Agreement executed by DWP and East Bay Municipal Utility District ("EBMUD") that became effective on September 13, 2000. A copy of said agreement is attached hereto as Exhibit C and incorporated herein by this reference. DWP agrees that CCWD, as a user of water diverted from the Delta at locations in close geographic and hydraulic proximity to the Project islands, is a third party beneficiary of said EBMUD/DWP Protest Dismissal Agreement.

9. DWP agrees that CCWD, as a member of CUWA, is a third party beneficiary of that certain Agreement to Resolve Certain Delta Wetlands Permit Issues, between CUWA and DWP, dated October 9, 2000, which is attached hereto as Exhibit D and incorporated herein by this reference.

10. This Agreement shall be binding upon and inure to the benefit of the successors in interest and legal representatives of the respective parties.

11. All changes or modifications to this Agreement shall be in writing and signed by CCWD and DWP.

12. The signatories hereto represent that they are authorized to enter into this Agreement on behalf of the party for whom they sign. This document may be executed in duplicate originals.

DELTA WETLANDS PROPERTIES, an Illinois general partnership

Dated: _____ By _____
Anne J. Schneider
ELLISON, SCHNEIDER & HARRIS

CONTRA COSTA WATER DISTRICT

Dated: OCTOBER 9, 2000 By Robert B. Maddow
Robert B. Maddow
BOLD, POLISNER, MADDOW, NELSON & JUDSON

12. The signatories hereto represent that they are authorized to enter into this Agreement on behalf of the party for whom they sign. This document may be executed in duplicate originals.

DELTA WETLANDS PROPERTIES, an Illinois general partnership

Dated: October 9, 2000

By _____
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By _____
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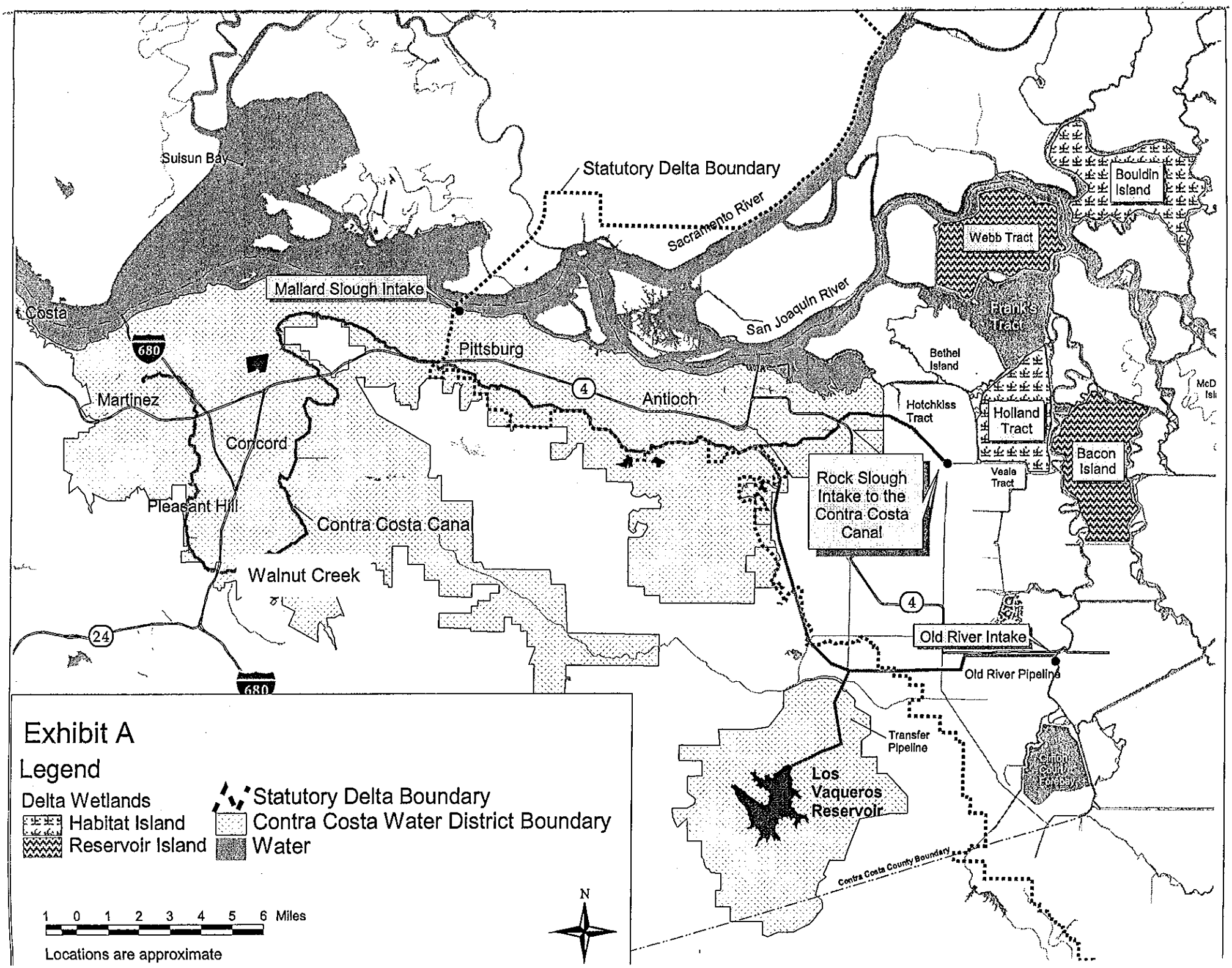
Exhibit A
Legend
Delta Wetlands
Habitat Island
Reservoir Island
Statutory Delta Boundary
Contra Costa Water District Boundary
Water
1 0 1 2 3 4 5 6 Miles
Locations are approximate
N
Suisun Bay
Statutory Delta Boundary
Sacramento River
San Joaquin River
Mallard Slough Intake
Pittsburg
Antioch
Martinez
Concord
Pleasant Hill
Contra Costa Canal
Walnut Creek
680
4
24
Webb Tract
Bouldin Island
Frank's Tract
Bethel Island
Hotchkiss Tract
Holland Tract
Bacon Island
Veale Tract
Rock Slough Intake to the Contra Costa Canal
Old River Intake
Old River Pipeline
Transfer Pipeline
Los Vaqueros Reservoir
Contra Costa County Boundary

EXHIBIT B

WATER QUALITY MANAGEMENT PLAN

October 9, 2000

Preamble

Delta Wetlands Properties ("DW") proposed a water storage project on four islands in the Sacramento-San Joaquin Delta ("Delta"). The project would involve diverting and storing water on two of the islands (Bacon Island and Webb Tract, or "reservoir islands") and seasonally diverting water to create and enhance wetlands and to manage wildlife habitat on the other two islands (Bouldin Island and Holland Tract, or "habitat islands").

The purpose of the Delta Wetlands Project ("Project") is to divert surplus Delta inflows, transferred water or banked water for later sale and/or release for Delta export or to meet water quality or flow requirements for the Delta. To operate the Project, DW would strengthen the levees and install additional siphons and water pumps on the perimeters of the reservoir islands. The Project is undergoing environmental review (CEQA and NEPA), water rights permitting (State Water Resources Control Board), and an appraisal level study of the Project by the U.S. Bureau of Reclamation ("USBR").

California Urban Water Agencies[1] ("CUWA") and its member agencies have been participating in the public review of the Project since 1997 and are parties to the water rights proceedings for the Project. The primary focus of CUWA's participation in the review of the Project has been to seek a commitment from the Project proponents to minimize and mitigate drinking water quality impacts due to Project operations. Because of the close proximity of the reservoir islands to the Banks Pumping Plant, Tracy Pumping Plant, Contra Costa Canal at Pumping Plant #1, Contra Costa Water District's ("CCWD") Los Vaqueros intake on Old River and CCWD's Mallard Slough intake (hereafter "urban intakes"), CUWA is concerned that there is a potential for DW operations to result in increased total organic carbon ("TOC"), bromide, total dissolved solids ("TDS"), and chloride concentrations in urban water supplies.

In an effort to address CUWA's water quality concerns, Delta Wetlands Properties proposes to implement a water quality management plan ("WQMP"). The WQMP includes drinking water quality protection principles, an annual operating plan, general operating principles, a comprehensive monitoring program, screening procedures and operational constraints, and mitigation of water quality impacts. Collectively, the elements of the WQMP are intended to provide the urban water utilities with the necessary assurances that the Project will be operated in a manner that will ensure the protection of public health and long-term integrity of drinking water supplies diverted from the Sacramento-San Joaquin Delta.

The WQMP was developed through a negotiated process to resolve issues that are specific to the Project. The terms and conditions of the WQMP are intended to address the potential for injury to senior water rights holders associated with water quality degradation caused by the Project.

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[1] All references to CUWA shall mean CUWA, its current member agencies and those member agencies of record as of the date of this agreement.

The impacts caused by the Project are unique because of its proximity to urban water agencies' intakes and the high rates of discharge from the reservoir islands. The Project, without the protections provided by the WQMP, has the potential to adversely impact human health by increasing disinfection by-products ("DBP") and to increase the overall cost of water utility operations. The Project could also lead to long-term degradation in drinking water quality. Because the WQMP includes distinctive features that are specific to DW, it should not be construed as setting a precedent that would be applicable to other dissimilar projects subject to State Water Resources Control Board jurisdiction.

A. Drinking Water Quality Protection Principles

The Project will adhere to the drinking water quality protection principles described below through the implementation of the terms and conditions of this WQMP.

1. Project operations shall cause no adverse health impacts to water users;

2. Project operations shall not cause nor contribute to non-compliance with current or future drinking water regulations;

3. Project operations shall cause no increases in the cost of water treatment or operations;

4. Project operations shall contribute to CALFED's progress toward achieving continuous improvement of Delta drinking water source quality; and

5. Project operations shall minimize and mitigate for any degradation in the quality of drinking water supplies.

B. Water Quality Management and Action Board and Annual Operating Plan

The Water Quality Management and Action Board and the Annual Operating Plan outlined below are intended to support the administration and implementation of the WQMP.

1. Prior to initiating or continuing Project operations, a Water Quality Management and Action Board ("WQMAB") shall be appointed to oversee the implementation of the WQMP for the Project subject to the procedures, duties and requirements set forth in Attachment 1.

2. Prior to February 15 of each year, DW will propose an Annual Operating Plan for approval by the WQMAB. The Annual Operating Plan will be updated monthly and coordinated with Central Valley Project, State Water Project, and CCWD operations. The Annual Operating Plan will include:

    a. Schedules and estimated quantities for diversions to the Project islands and discharges from the Project islands.

    b. Water quality goals and objectives, including the estimated concentration of TOC, bromide, chloride, and TDS for the diversions to the Project islands and discharges from the Project islands.

c. An estimate of the projected change in the concentration of TOC, bromide, chloride, and TDS at the urban diversion locations due to scheduled Project operations.

d. Maximum allowable concentrations of the water quality constituents of concern (TOC, bromide, TDS, and chloride) for water stored on the reservoir islands, above which it will be necessary for DW to pursue remedial actions pursuant to the Emergency Operating Plan. The maximum allowable concentrations are upper limits above which discharge of water from the reservoir islands may cause a violation of one or more of the drinking water quality protection principles.

e. An Emergency Operating Plan describing remedial actions to be taken by DW in the event the water stored on the reservoir islands exceed the maximum allowable concentrations for the constituents of concern, including a procedure for discharge of the water from the reservoir islands that will minimize the potential for impacts to urban water utilities.

f. A schedule for habitat island operations, including diversion and discharge rates.

g. A schedule for reservoir island operations for non-storage periods.

h. A description of the monitoring program, hydrodynamic models, and particle-tracking models pursuant to Section D.

i. A description of mitigation measures to be implemented by DW to offset any long-term net increase in TOC, TDS, bromide or chloride loading pursuant to Section F.

C. General Operating Principles

The general operating principles outlined below are intended to support implementation of the WQMP.

1. To maintain low TOC, bromide and salinity levels to the fullest extent practicable, DW will:

   a. Avoid practices that will result in high TOC productivity during non-storage periods;

   b. Avoid diversions to storage during peak TOC periods;

   c. Avoid diversions to storage during high bromide and high salinity periods; and

   d. Manage vegetative growth on the reservoir islands to minimize TOC production.

2. To avoid degradation in water quality at the urban intakes in the Delta, DW will develop operational procedures to:

   a. Reduce the rate of discharge from the reservoir islands as appropriate;

b. Coordinate discharges between reservoir islands; and

c. Adjust discharges for exports in accordance with Delta hydrodynamic (e.g., tides, pulse flows).

3. To avoid excessive TOC, bromide and salinity levels, DW will:

a. Pursue remedial actions or acquire offsets before initiating further diversions to storage if TOC, bromide or salinity concentrations on reservoir islands regularly exceed 80% of the maximum allowable concentrations set forth in the Annual Operating Plan.

D. Comprehensive Monitoring Program

The comprehensive monitoring program outlined below will be developed and in place prior to initiating Project operations. The monitoring program provides for the collection of data to support the screening of Project operations and for imposition of operational constraints pursuant to Section E and the identification of mitigation requirements pursuant to Section F.

1. DW will conduct real-time water quality monitoring on the reservoir and habitat islands and in the Delta channels at the discharge locations of the reservoirs and habitat islands prior to and during all discharge periods.

2. The State Department of Water Resources ("DWR"), USBR and CCWD will provide real-time water quality monitoring data at urban intakes in the Delta.

3. The owners of urban water treatment facilities will provide water quality monitoring and operational data at water treatment plants.

4. The water quality monitoring program shall include quality assurance and quality control provisions.

5. Monitoring parameters will include TOC, bromide, TDS, chloride, UVA, DO, turbidity, and temperature.

6. DW will post monthly summaries of the data collected pursuant to subsections 1 through 3 above on the DW web site or adopt an alternative means of disseminating this information to the WQMAB and interested parties that provides an equivalent degree of accessibility.

7. Hydrodynamic and particle-tracking models will be used to predict both baseline conditions (without Project) and real-time changes at the urban intakes in the Delta prior to, during and after a Project operation. DW will submit a proposed monitoring and modeling program for approval by the WQMAB prior to operating the reservoir islands with annual updates and approvals of the modeling program thereafter (through the Annual Operating Plan review process) to reflect advances in science and technology.

Water quality constituent predictions required by the WQMP shall be calculated in accordance with the initial models and modeling assumptions set forth in Attachment 3, unless otherwise approved by the WQMAB.

E. Screening Procedures and Operational Constraints to Prevent Short-Term Impacts

The process outlined below for screening of Project operations and imposition of operational constraints is intended to prevent short-term impacts to urban water utilities and to ensure adherence to the drinking water quality protection principles 1 through 3 set forth in Section A.

1. Operational screening criteria will be used to identify Project operations that may threaten adherence to one or more of the drinking water quality protection principles. The operational screening criteria are set forth in Attachment 2 and implemented as described below.

2. Prior to DW initiating each diversion to the reservoir islands and each discharge from the reservoir islands and weekly thereafter during continuing diversions and discharges, the hydrodynamic and particle-tracking models will be used to predict whether Project operations (including operations of the habitat islands) are likely to exceed one or more of the operational screening criteria at the urban intakes in the Delta. (See Attachment 2, criteria A1, A2, B1, B2, C1, and C2.)

3. If the model output indicates that Project operations may exceed one or more of the operational screening criteria at one or more of the urban intakes in the Delta, DW will conduct further studies (prior to initiating a diversion to the reservoir islands or a discharge from the reservoir islands) to determine whether one or more of the drinking water quality protection principles would be threatened at an urban water treatment plant. (See Attachment 2, criteria A3, B3, and B4.)

4. If, upon further study, it appears that Project operations may threaten one or more of the drinking water protection principles at an urban water treatment plant, a determination will be made whether the threat would be offset by a Project-induced water quality or water supply improvement. If the owner of the impacted water treatment plant agrees that the threat would be offset or agrees to waive its right to protection under the WQMP, DW may initiate the diversion to the reservoir islands or discharge from the reservoir islands.

5. If Project operations threaten a drinking water quality protection principle at the water treatment plant without offsetting benefits and the treatment plant owner has not waived its right to protection, Project operations will be reduced, rescheduled or otherwise constrained as necessary to prevent the impact from occurring.

6. If an urban water treatment plant owner presents a complaint to DW and the WQMAB that: (1) a violation of a drinking water quality protection principle has occurred or is likely to occur in the absence of remedial action, or (2) one of the Project screening criteria set forth in Attachment 2 has been exceeded or is likely to be exceeded in the absence of remedial action, and (3) the WQMAB finds that the complaint has sufficient

merit to warrant an investigation; the WQMAB shall proceed with an investigation of the complaint. Throughout the duration of the WQMAB's investigation of the complaint and until the matter is resolved by the WQMAB, Project operations shall be restricted such that the maximum discharge rate from a reservoir island shall not exceed the schedule set forth in Table 1. Alternatively, the Project operations may proceed pursuant to the terms of an Emergency Operating Plan that has been approved by the WQMAB. DW shall cooperate with the WQMAB throughout the duration of the investigation.

7. If the WQMAB pursuant to the investigations set forth in paragraph E.6 make a finding that monitoring, modeling, and/or operational constraints fail to prevent a violation of a drinking water quality protection principle resulting from Project operations, or fail to prevent an exceedance of one of the operational screening criteria set forth in Attachment 2 due to Project operations, the WQMAB shall require DW to initiate emergency operations or take remedial actions to correct the problems.

Table 1[1]

TOC Concentration on Bacon Island Minus That of Ambient Water (mg/L)[2]	Maximum Discharge Rate from Bacon Island (cfs)[2]	TOC Concentration on Webb Tract Minus That of Ambient Water (mg/L)	Maximum Discharge Rate from Webb Tract (cfs)[2]	Chloride Concentration on a Reservoir Island (mg/L)	Maximum Combined Discharge Rate from Bacon Island and Webb Tract (cfs)[2]
0 to 1.0	1,500	0 to 3.0	1,500	0 to 50	3,000
1.1 to 2.0	1,250	3.1 to 4.0	1,250	51 to 70	2,500
2.1 to 3.0	1,000	4.1 to 5.0	1,000	71 to 90	2,000
3.1 to 4.0	750	5.1 to 6.0	750	91 to 110	1,500
4.1 to 5.0	500	6.1 to 7.0	500	111 to 130	1,000
5.1 to 6.0	250	7.1 to 8.0	250	131 to 150	500
6.1 to 7.0	125	8.1 to 9.0	125	151 to 170	250
Greater than 7.0	40	Greater than 9.0	40	171 to 250	80

Table 1 footnotes:

[1] The restrictions on discharges from the reservoir islands contained in Table 1 for various concentrations of TOC and chloride are not applicable if the TOC and chloride concentrations on a reservoir island are less than or equal to the average TOC and chloride measured in the channels adjacent to the reservoir islands for the 7-day period prior to initiating the discharge.

[2] The maximum discharge rate means the average discharge rate over a 14-day period or the duration of the discharge, whichever time period is less. The maximum discharge rate shall be further constrained, as necessary, to limit the total contribution from the reservoir islands at the urban intakes to 25% of the combined export pumping at the Banks and Tracy pumping plants.

F. Mitigation of Long-Term Water Quality Impacts.

The process outlined below for mitigation of long-term water quality impacts due to Project operations is intended to prevent long-term impacts to urban water utilities and ensure adherence to the drinking water quality protection principles 3 and 4 set forth in Section A. Should Project operations produce a long-term net increase in TOC, TDS, bromide or chloride loading in the urban diversions, mitigation may be necessary, as described below:

1. During the course of the 12-month operating plan, DW shall maintain a running account of the changes in TOC, TDS, bromide and chloride in the water diverted from the Delta for urban use due to Project operations.

2. Once every three years, DW shall submit an accounting of the net increase or decrease in TOC, TDS, bromide and chloride loading in the water diverted from the Delta for urban use due to Project operations (including habitat island operations).

3. DW shall be required to acquire offsets or otherwise mitigate 150% of the net increase in TOC, TDS, bromide and chloride loading greater than 5% in the urban diversions due to Project operations.

4. DW must acquire the offsets or complete the mitigation at its expense within 24 months after the submission of the accounting set forth in 2 above. Any offset or mitigation that is provided in the current accounting period that is due to a mitigation requirement that accrued during a previous accounting period shall be excluded from the calculation of the net increase for the current accounting period.

5. In recognition of initial Project start-up, long-term mitigation requirements for TOC loading shall be waived for the first year of reservoir operation; however, the screening procedures and operational constraints to prevent short-term impacts set forth in Section E shall still apply.

ATTACHMENT 1
WATER QUALITY MANAGEMENT AND ACTION BOARD

1. **Purpose**: A Water Quality Management and Action Board ("WQMAB"), or an equivalent mutually acceptable authority, shall be appointed to oversee the implementation of the Water Quality Management Plan ("WQMP") for the Delta Wetlands Project ("Project").

2. **Members**:

   a. **Qualifications**: The three members and three alternates shall be registered professional engineers, public health professionals or scientists possessing a thorough understanding of Delta operations and recognized for their expertise in organic and inorganic water chemistry and drinking water treatment.

   b. **Appointment Process**: The State Water Resources Control Board ("SWRCB"), California Urban Water Agencies ("CUWA"), and Delta Wetlands Properties ("DW") shall each appoint one member and one alternate. Each prospective member of the WQMAB shall be required to disclose any past or current conflicts of interest that may affect their ability to serve as impartial members of the WQMAB. Appointment of prospective members with past or current conflicts of interest must be approved by the mutual consent of CUWA and DW. In the event that the SWRCB does not appoint its member or alternate to the WQMAB, CUWA and DW shall appoint the SWRCB's member or alternate member. Each of the WQMAB members shall be appointed for a term of four years. At the end of the 4-year term, the same selection process will be used to select the new WQMAB.

3. **Term**: The WQMAB shall be established prior to the first diversions to storage on Bacon Island or Webb Tract ("initial operations") and shall continue thereafter for the duration of Project reservoir operations.

4. **Compensation**: Members of the WQMAB are to be compensated by DW for their time on an hourly basis. Such costs, including costs of reports which may be prepared and studies which may be undertaken by the WQMAB shall be part of the annual operation and maintenance costs of the Project.

5. **Duties**:

   a. The WQMAB shall serve as a neutral water quality advisory panel, hearing and investigating formally identified problems purportedly caused by Project reservoir operations, including but not limited to nonconformance with the Annual Operating Plan and violations of the Drinking Water Quality Protection Principles.

   b. Prior to initial operations and annually thereafter, DW shall submit a proposed Annual Operating Plan for approval by the WQMAB pursuant to Section B of the WQMP.

i. Prior to approving the Annual Operating Plan, the WQMAB shall provide an opportunity to comment on the draft Annual Operating Plan to the SWRCB, CUWA, and all other parties who have notified the WQMAB of their interest to comment on the draft Annual Operating Plan ("Interested Parties").

ii. In the event of any objection by CUWA or an Interested Party, the WQMAB may only approve the Annual Operating Plan after holding a noticed hearing on the proposed operating plan.

iii. If the WQMAB approves the Annual Operating Plan, the WQMAB shall immediately so advise DW.

iv. If the WQMAB does not approve an Annual Operating Plan, the WQMAB shall, within 10 days, provide a report explaining its decision to DW and to the Executive Director of the SWRCB. DW may provide a response to the WQMAB report to the Executive Director.

v. The issue of adequacy of the Annual Operating Plan will be decided by the Executive Director of the SWRCB as soon as possible upon receipt of such report.

vi. If the WQMAB does not approve the Annual Operating Plan for any reason, DW may continue its reservoir operations pursuant to the previously approved Annual Operating Plan or pursuant to paragraph E.6 of the WQMP, if applicable.

c. DW shall make available water quality monitoring and modeling data to the WQMAB pursuant to Sections D and E of the WQMP.

d. During the first two years following initial operations, the WQMAB shall review water quality monitoring data at each stage of filling and discharge of the reservoir islands.

e. At the end of the third year of operations and every three years thereafter, DW shall submit to the WQMAB an accounting of the net increase or decrease in water quality parameters of concern in the water diverted from the Delta for urban use due to Project operations pursuant to Section F of the WQMP. Prior to initiating the fourth year of operations and each year thereafter, the Annual Operating Plan shall include a plan to offset or otherwise mitigate any net increase in water quality parameters of concern pursuant to Section F of the WQMP.

f. If the WQMAB determines that the Project operations are not in conformance with the Annual Operating Plan, the WQMAB shall require the permittee to initiate emergency operations or take remedial actions to correct problems as provided for in paragraph E.7 of the WQMP.

g. The terms of the WQMP may be adjusted over time by the SWRCB as set forth below. The SWRCB reserves jurisdiction over changes in the WQMP to coordinate or modify its terms for the protection of other legal users of water and the public interest as future

conditions may warrant. The SWRCB delegates authority to the Executive Director of the SWRCB to take actions under this reservation of jurisdiction as set forth below.

i. During the third year of Project operations, the WQMAB shall review the WQMP to determine if changes in any of the WQMP terms are advisable. In its review, the WQMAB shall examine actual operation of the Project to date and any adverse effects of Project reservoir operations, including impacts to urban water agencies, degradation of drinking water quality, overall progress toward achieving continuous improvement of drinking water source quality, and any recent changes in state and federal drinking water regulations. The WQMAB will base each of its recommended changes to WQMP terms, if any, on its independent, professional judgment. At the conclusion of its review, the WQMAB shall issue a written list of its recommended changes, if any. The list shall be sent by the WQMAB to the SWRCB, DW, CUWA, and all other Interested Parties.

ii. If no party raises a reasonable objection to a change recommended by the WQMAB within 30 days of service of any proposed change, then the Executive Director of the SWRCB may approve the change without the need for a comment period or hearing. In the event of any objection, the SWRCB may only approve the change after it provides notice of and an opportunity to comment on the proposed change. If requested by an DW, CUWA, or any Interested Party, the SWRCB may hold a hearing on the proposed change.

h. After its initial 3-year review of the WQMP as set forth above, the WQMAB may thereafter periodically review and change the terms of the WQMP so long as the SWRCB review and approval process set forth above is followed.

ATTACHMENT 2
OPERATIONAL SCREENING CRITERIA

Operational Constraints

The operational screening criteria outlined in this attachment were developed to support the process outlined in Section E of the Water Quality Management Plan ("WQMP") for screening of Delta Wetlands Project ("Project") operations and imposition of operational constraints. This process is intended to support Delta Wetlands' ("DW") adherence to the drinking water quality protection principles 1 through 3 described in Section A of the WQMP.

These screening criteria are based on existing state and federal standards for disinfection by-products and their precursors. Should drinking water DBPs, contaminants or precursors, or any other drinking water contaminants be further regulated under state or federal law, the WQMAB shall recommend that the SWRCB amend the screening criteria to ensure that the intent of the drinking water quality protection principles continues to be met.

Evaluation of Project operations using these screening criteria will be based on real-time field measurements and computer modeling results, both of which are subject to uncertainties. For purposes of determining whether the Project has caused an exceedance of one or more of the operational screen criteria, an uncertainty of ±5% of the screening criteria will be assumed.[2] Should greater precision in measurements and calculations be developed, the improved level of confidence will be used as appropriate for each individual parameter.

An exceedance of the operational screening criteria set forth in Sections A, B and C below shall be calculated as a 14-day average, or the average for duration of the discharge, whichever time period is less.

A. TOC Loading

The criteria below will be used in the screening procedures set forth in paragraphs E2 and E3 of the WQMP and in the imposition of operational constraints in paragraph E5 of the WQMP. The criteria are intended to prevent an impact due to Project-related TOC loading that may cause an increase in water treatment costs.

1. Project operations that cause an increase in TOC of more than 1.0 mg/L at the urban intakes; or

2. Project operations that cause TOC concentrations at the urban intakes to exceed 4.0 mg/L; and

[2] An uncertainty of ±5% shall mean that an exceedance of an operational screen criteria does not occur until the Project causes the following values to be exceeded: condition A.1 not applicable; conditions A.2 and A.3 = 0.2 mg/L TOC; conditions B.1 and B.3 = 3.2 µg/L TTHM; conditions B2 and B4 = 0.4 µg/L bromate; conditions C1 and C2 not applicable.

3. Project operations that cause TOC concentrations at a water treatment plant to exceed 4.0 mg/L.

B. DBP Formation

The criteria below will be used in the screening procedures set forth in paragraphs E.2 and E.3 of the WQMP and in the imposition of operational constraints in paragraph E.5 of the WQMP. The criteria are intended to prevent an impact due to Project-related DBP precursor loading that may cause health impacts to water users or may cause or contribute to a water treatment plant violation of a health regulation:

1. Project operations that cause or contribute to modeled Total Trihalomethanes ("TTHM") concentrations in drinking water in excess of 64 µg/L, as calculated in the raw water of an urban intake in the Delta;
2. Project operations that cause or contribute to modeled bromate concentrations in drinking water in excess of 8 µg/L, as calculated in the raw water of an urban intake in the Delta;
3. Project operations that cause or contribute to predicted TTHM concentrations in drinking water in excess of 64 µg/L, as calculated from measurements at the outlet of a water treatment plant; or
4. Project operations that cause or contribute to predicted bromate concentrations in drinking water in excess of 8 µg/L, as calculated from measurements at the outlet of a water treatment plant.

C. Salinity Impacts Resulting from Project Operations

The criteria below will be used in the screening procedures set forth in paragraphs E.2 and E.3 of the WQMP and in the imposition of operational constraints in paragraph E.5 of the WQMP. The criteria are intended to promote Project operations that select the highest water quality for diversion to the islands and minimize salinity impacts associated with discharges from the reservoir islands:

1. Project operations that cause an increase in salinity of more than 10 mg/L chloride at one or more of the urban intakes; or
2. Project operations that cause or contribute any salinity increase at the urban intakes in the Delta exceeding 90% of an adopted salinity standard (e.g., Rock Slough chloride standard defined in SWRCB Decision 1641).

ATTACHMENT 3
INITIAL MODELING ASSUMPTIONS

The screening procedures and long-term mitigation requirements of the Water Quality Management Plan ("WQMP") require several analytical tools to predict water quality and disinfection by-products ("DBP") changes or Total Trihalomethanes ("TTHM"). Three models will be required to implement the WQMP: 1) a water quality model, 2) a particle-tracking model, and 3) a water treatment model for DBPs. The Annual Operating Plan sets forth periodic update and approval requirements of the final modeling program; however, the initial modeling assumptions included in the evaluations for the WQMP have been included below:

1. Initial modeling assumptions
   a. Baseline hydrology: existing conditions and short-term forecasts (50% exceedence) of future conditions
   b. Baseline water quality: Fischer Delta Model Version 10 with real tide simulations

2. Initial land use assumptions
   a. No-Project irrigation and drainage quantities: DWR DICU historic rates
   b. No-Project agricultural drainage quality:
      i. Ag bromide to channel bromide ratio (Ag/Ch Ratio) = max ($65.597 * Ch^{-0.6436}$ or 125%)
      ii. Ag TOC = Average of west and south Delta MWD assumptions

3. TTHM Model (Malcolm Pirnie)

$$TTHM = 7.21 \times TOC^{0.004} \times UVA_{254}^{0.534} \times (Cl_{DOSE} - 7.6 \times NH_3N)^{0.224} \times Cl_{TIME}^{0.255} \times (Br+1)^{2.01} \times (pH-2.6)^{0.719} \times T^{0.48}$$

Where:

TOC = raw water TOC (mg/l) x (0.75 if TOC<4 or 0.65 if TOC>4)

$UVA_{254} = 0.033 \times TOC + 0.010$

Cl_{DOSE} (Cl:TOC ratio) = 1.0

NH_3N = Not Applicable

Cl_{TIME} (contact time) = 1.0 hour

Br = raw water bromide (mg/l)

pH = 7.0

T = Monthly average raw water temperature (9-24°C)

4. Bromate Model (Ozekin)

$$BRM = [1.63\ E\text{-}06 \times TOC^{-1.26} \times pH^{5.82} \times O3_{DOSE}^{1.57} \times Br^{0.73} \times O3_{TIME}^{0.28}] \times BRMCF$$

Where:

TOC = raw water TOC (mg/l) x (0.75 if TOC<4 or 0.65 if TOC>4)

pH = 7.0

$O3_{DOSE}$ (O3:TOC ratio) = 0.6

Br = raw water bromide (µg/l)

$O3_{TIME}$ (contact time) = 12 minutes

BRMCF (bromate correction factor) = 0.56

Exhibit C

Protest Dismissal Agreement Between
Delta Wetlands Properties and
East Bay Municipal Utility District

A copy of this agreement is contained elsewhere in this Appendix