STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

DECISION #2001-

In the Matter of
Applications 29061, 29062, 29063, 29066, 30267, 30268, 30269, and 30270, and
Petitions to Change These Applications, of
DELTA WETLANDS PROPERTIES

SOURCES: False River, San Joaquin River, Old River, Middle River, Santa Fe Dredge Cut, and Connection Slough

COUNTIES: Contra Costa and San Joaquin

DECISION APPROVING CERTAIN APPLICATIONS AND PETITIONS AND CANCELLING WITHDRAWN APPLICATIONS

BY THE BOARD:

1.0 INTRODUCTION

This decision of the State Water Resources Control Board (SWRCB) conditionally approves the water right applications and petitions needed to appropriate water by direct diversion and storage to reservoirs on Webb Tract and on Bacon Island in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Delta or Bay-Delta Estuary).

Delta Wetlands Properties (DW) filed its first water right applications for the Delta Wetlands Project on July 9, 1987. Since that time, DW has filed additional applications and has filed petitions for change of all of its applications. Protests have been filed against the applications and petitions, and some of the protests have not been resolved. The SWRCB has conducted the hearing on the DW applications in two parts. The SWRCB conducted the first part of the hearing, noticed on March 11, 1997, on July 8, 9, 14, 15, 22, 23, 24, 29, 30, and 31, and on August 19 and 20, 1997. In a letter dated November 25, 1998, the Executive Director of the SWRCB advised DW of the concerns of the SWRCB with the project and the inadequacy of the hearing record at that time to support a decision approving the project. DW subsequently agreed to fund additional environmental documentation and to provide additional evidence at a further hearing. The lead agencies directed preparation of a Revised Draft Environmental Impact

Report/Environmental Impact Statement (RDEIR/EIS) for the project, which was released in draft for comments on May 31, 2000. Comments on the RDEIR/EIS were due on July 31, 2000. The SWRCB has considered all of the evidence and arguments in the hearing record. The SWRCB conducted the second part of the hearing on October 10, 11, and 12, 2000, pursuant to a notice dated June 16, 2000.

The DW Project is unique as a proposal to construct reservoirs on islands in an estuary. In the course of developing the project and preparing environmental documentation, DW has resolved many of the problems associated with storing water in the Bay-Delta Estuary. Particularly with respect to protection of fish and wildlife, DW has accomplished much. It has developed ways to screen fish at large diversion intakes; it has developed protections and even enhancements for Delta fisheries; it has designed innovative large-scale wildlife and wetlands mitigation measures on two islands devoted to habitat preservation. In addition, DW has negotiated a Programmatic Agreement to protect historical resources and has negotiated agreements to mitigate the potential impacts of the DW Project on the quality of water diverted from the Delta for municipal uses. Where appropriate, mitigation measures based on the agreements will be included in the permits for the DW Project. DW has not reached agreements regarding several protests. This decision establishes terms and conditions to protect the public interests represented by the unresolved protests, where appropriate.

The SWRCB finds as follows:

2.0 BACKGROUND

DW filed Applications 29061, 29062, 29063, and 29066 on July 9, 1987, to appropriate water to storage on four islands in the Delta. The four islands, respectively, are Bouldin Island, Webb Tract, Holland Tract, and Bacon Island. Under these applications, DW originally proposed to maintain seasonal wetlands on all four islands during the autumn, fill the islands with water from the channels of the Delta during the winter, and release the water for sale and export in the spring. The requested season of diversion was December 15 to May 1. On July 21, 1993, DW filed Applications 30267, 30268, 30269, and 30270 for (1) direct diversion rights on each of the four islands, (2) a year-round season of diversion, and (3) additional storage rights. Also on July 21, 1993, DW filed petitions for change of the applications filed on July 9, 1987. The petitions for change included changes in points of diversion and rediversion, places of use, and purposes of use.

On November 28, 1994, DW filed petitions for change of Applications 30267, 30268, 30269, and 30270. These petitions request additional on-island points of diversion to allow for a new appropriation of water already diverted onto the islands under existing water rights held or claimed by DW. If these petitions are approved with their associated applications, the water diverted earlier in the year under the existing rights could be retained in storage on the islands under the new applications and subsequently discharged for export or outflow. Otherwise, Permittee must release the water and divert new water from the Delta channels. The amounts of water that could be newly appropriated under these petitions represent a minor part of the water applied for under the pending applications.

During the water right hearing and in its closing brief, DW stated its intent to withdraw Applications 29061, 29063, 30267, and 30269 to divert water to Bouldin Island and Holland Tract. DW does not plan to store water on these islands. DW has designated these islands as wildlife habitat islands, to be used to offset potential wildlife and wetland impacts of the reservoirs it wishes to construct on Webb Tract and Bacon Island. DW plans to use water under its existing water rights to support wildlife habitat on the habitat islands. Accordingly, Applications 29061, 29063, 30267, and 30269 are not approved in this decision, and will be canceled. The remaining applications and petitions that are not canceled are summarized in Table 1A.

At the conclusion of the 1997 hearing days, the hearing officer held the hearing record open to receive in evidence DFG exhibit 5A, the transcript of a deposition regarding DFG exhibit 5A, and the final EIR/EIS. The hearing officer also set a schedule for the parties to file closing briefs and reply briefs. On September 16, 1997, DW deposed Department of Fish and Game (DFG) witness Deborah McKee, regarding DFG exhibit 5A. After Ms. McKee signed her deposition transcript, DFG offered the deposition transcript and DFG exhibit 5A in evidence. DFG exhibit 5A and the transcript were accepted in evidence during the hearing session in October 2000.

TABLE 1A

SUMMARY OF DELTA WETLANDS WATER RIGHT APPLICATIONS for Webb Tract and Bacon Island New and Amended Applications to Appropriate Water [1]

ISLAND TRACT (County)	WEBB TRACT (Contra Costa)		BACON ISLAND (San Joaquin)	
Application (A) Number	A29062	A30268	A29066	A30270
Filing Date	July 9, 1987	July 21, 1993	July 9, 1987	July 21, 1993
Sources	(A) False River, (B) San Joaquin River, (C) Old River	(A) False River, (B) San Joaquin River, (C) Old River	(A) Old River, (B) Middle River, (C) Santa Fe Dredge Cut, (D) Connection Slough	(A) Old River, (B) Middle River, (C) Santa Fe Dredge Cut, (D) Connection Slough
Season(s) of Diversion	Dec. 15 - May 1	Jan. 1 - Dec. 31	Dec. 15 - May 1	Jan. 1 - Dec. 31
Reservoir Size	106,900 AF [2]	131,000 AF	110,570 AF	129,000 AF
Storage Amount	106,900 afa [2]	155,000 afa	110,570 afa	147,000 afa
Maximum Rate of Diversion to Storage	5,000 cfs [2]	4,733 cfs	5,000 cfs	4,809 cfs
Average Direct Diversion Rate	N/A [2]	3,000 cfs	N/A	3,000 cfs
Pump/Siphon Capacity	5,000 cfs	5,000 cfs	5,000 cfs	5,000 cfs
Combined Maximum Annual Appropriation	106,900 afa	417,000 afa	110,570 afa	405,000 afa
Points of Diversion (POD)	1 new POD along (A), 6 existing PODs along (A), 1 new POD along (B), 11 existing PODs along (B), 1 existing POD along (C). See sources (A-C) above & Figure 1.	1 new POD along (A), 6 existing PODs along (A), 1 new POD along (B), 11 existing PODs along (B), 1 existing POD along (C). See sources (A-C) above & Figure 1.	1 new POD along (A), 10 existing PODs along (A), 1 new POD along (B), 11 existing PODs along (B), 3 existing POD along (C), 4 existing PODs along (D). See sources (A-D) above & Figure 1.	1 new POD along (A), 10 existing PODs along (A), 1 new POD along (B), 11 existing PODs along (B), 3 existing PODs along (C), 4 existing PODs along (D). See sources (A-D) above & Figure 1.
Points of Rediversion (PORD)	3 export locations (see footnote 3) & all PODs specified in A30270. See Figure 1.	3 export locations (see footnote 3) & all PODs specified in A30270. See Figure 1.	3 export locations (see footnote 3) & all PODs specified in A30268. See Figure 1.	3 export locations (see footnote 3) & all PODs specified in A30268. See Figure 1.
Reappropriation[4]: Points of Diversion	N/A	•Reappropriation at discharge locations shown on Figure 1. Reappropriates water previously used under licensed A2952 (July 28, 1922), riparian claim, or storage under pending A30268.	N/A	•Reappropriation at discharge locations shown on Figure 1. Reappropriates water previously used under licensed A2954 (July 28, 1922), riparian claim, or storage under pending A30270.
Maximum Rate of Diversion to Storage	N/A	•4000 cfs	N/A	•4000 cfs
Discharge Locations	1 pump station on the False River, see Figure 1.	1 pump station on the False River, see Figure 1.	1 pump station on the Middle River, see Figure 1.	1 pump station on the Middle River, see Figure 1.
Place of Use	Footnote (5)	Footnote (5)	Footnote (5)	Footnote (5)
Purpose(s) of Use	Footnote (6)	Footnote (6)	Footnote (6)	Footnote (6)

1. Information in this table is derived primarily from the notices of the applications and petitions for change. Specific information is consistent with information included in the SWRCB's working copy of the application forms and engineering maps. The dates of notice are Dec. 4, 1987, Aug. 6, 1993, and Apr. 7, 1995. For additional information, see application files and project engineering maps for: A29062 & A29066 (dated July 9, 1987) and A30268 & A30270 (dated July 21, 1993); all on file with the SWRCB
2. Abbreviations: AF = acre-feet afa = acre-feet per annum cfs = cubic feet per second N/A = Not Applicable
3. Export using the State Water Project Banks Pumping Plant, the Central Valley Project Tracy Pumping Plant, and/or the Contra Costa Canal Pumping Plant.
4. See the April 7, 1995, notice of petition to change. Applicant proposes to appropriate irrigation water previously diverted onto the reservoir islands pursuant to other water rights, instead of releasing that irrigation water and diverting new water onto the reservoir islands.
5. Within the Central Valley Project and State Water Project service areas and the San Francisco Bay-Delta Estuary as shown on maps on file with the SWRCB.
6. Irrigation, domestic, municipal, industrial, fish & wildlife preservation and enhancement, and/or water quality uses.

Note: The information in this table indicates the facilities, volumes, and rates as originally filed and/or as amended. The information does not reflect the permitted facilities, volumes, and rates under the approved project (two reservoir islands, two habitat islands), or as limited by environmental and other requirements.

FIGURE 1

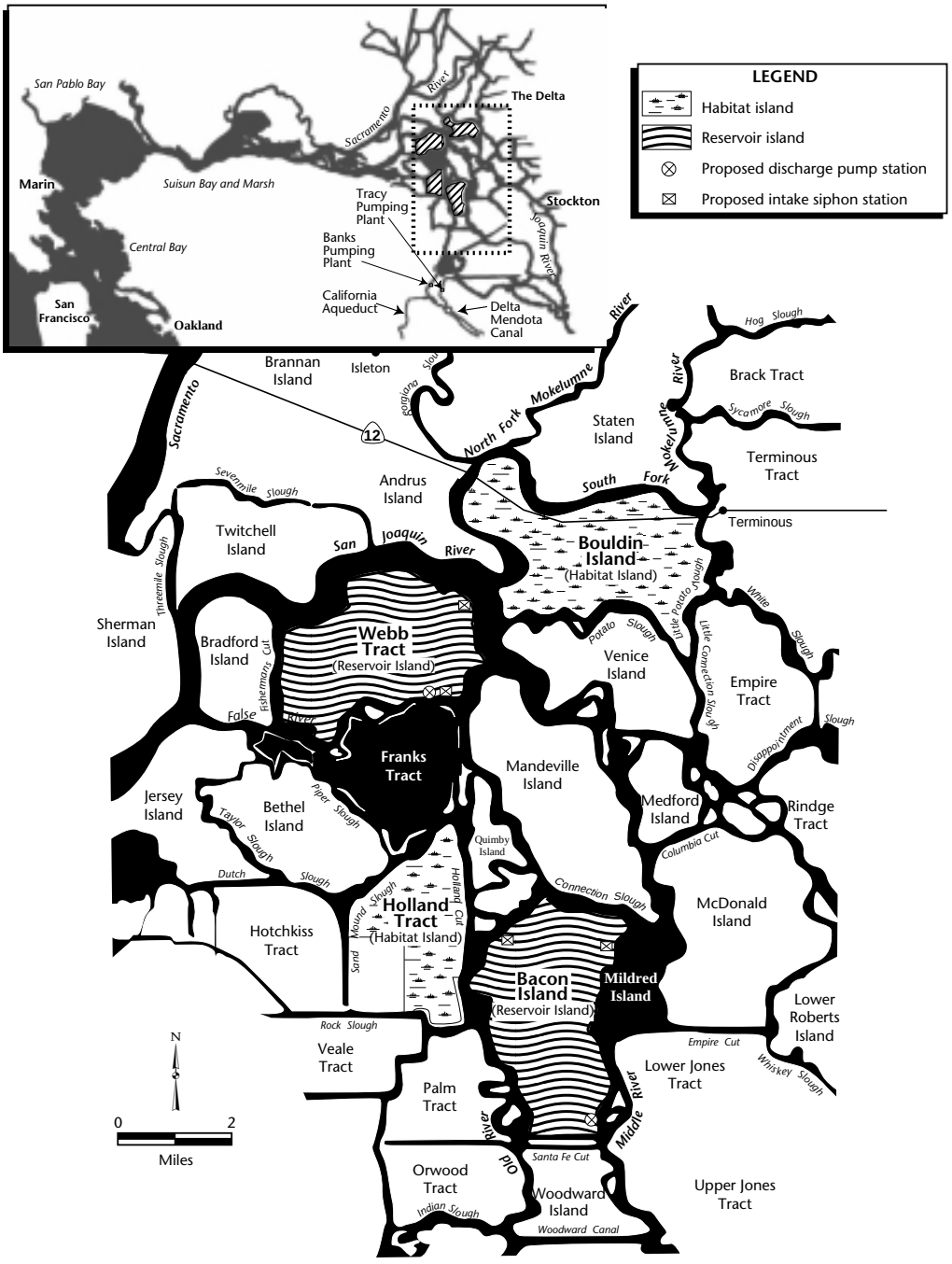

Figure 1
Delta Wetlands Project Islands

Overall, DW substantially narrowed the scope of its proposed project compared with the applications. As narrowed, the DW Project falls entirely within the scope of the applications and petitions described above.

3.0 THE PROPOSED PROJECT

DW proposes to use Webb Tract and Bacon Island as reservoirs, and to use Bouldin Island and most of Holland Tract as wildlife habitat islands to offset potential adverse environmental impacts of operating the reservoir islands. DW would divert water into the two reservoirs using two intake siphon stations on each island. Each station would include 16 screened siphons, with supplemental pumps in the siphons to complete the filling process. Stored water would be discharged at one pump station on each island. The discharge pump station on Webb Tract would have 32 pumps. The discharge pump station on Bacon Island would have 40 pumps. DW anticipates either rediverting the discharged water at the State Water Project's (SWP) Banks Pumping Plant (Banks), at the Central Valley Project's (CVP) Tracy Pumping Plant (Tracy), or at the Contra Costa Canal intake, or using the water to meet Delta water quality and flow objectives. For the reservoir applications, the requested places of use are the combined places of use of the SWP and the CVP south and west of the Delta, and the Bay-Delta Estuary. The requested purposes of use are irrigation, domestic, municipal, industrial, fish and wildlife preservation and enhancement, and water quality uses. The points of diversion are shown on Figure 1. Consistent with the biological opinions issued by National Marine Fisheries Service (NMFS) and United States Fish and Wildlife Service (USFWS) which do not allow inter-island transfers, DW has withdrawn its request for rediversion from one island to the next.

DW would divert water onto the habitat islands using some of the existing siphons, retrofitted with fish screens. Instead of diverting water under the applications it filed for Bouldin Island and Holland Tract, DW plans to divert water to the habitat islands under its claim of riparian rights and under its senior appropriative water rights. DW would manage the habitat islands under a Habitat Management Plan (HMP) to offset potential impacts of the reservoir project. The HMP was prepared by Jones and Stokes Associates, the EIR/EIS consultant, as part of the draft EIR/EIS, in consultation with staff of SWRCB, DFG, the U.S. Army Corps of Engineers (USACE), DW, California Waterfowl Association, Ducks Unlimited, and Contra Costa County Fish and Wildlife Committee. The primary purpose of use of water diverted onto the habitat islands would be management of the wildlife and wetland habitat.

4.0 ISSUES FOR HEARING AND PROTESTS

4.1 Hearing Issues

The Notice of Public Hearing issued by the SWRCB on March 11, 1997, listed the following key hearing issues.

"1. Is there adequate unappropriated water available for appropriation by the applicant's proposed project described in the 1995 DEIR/EIS? If water is available, when and under what circumstances is it available? Will the applicant's proposed project operate to the injury of legal users of the water involved? What permit terms and conditions should the SWRCB include in any water right permits issued on these applications to protect prior rights and legal users of water?

"2. Will the issuance of water right permits for this project best conserve the public interest? If the SWRCB approves these applications, will the water set aside for appropriation under the resulting permits be put to reasonable and beneficial uses?

"3. Will the applicant's proposed project be consistent with water quality control plans for any areas affected by the applicant's proposed project? What terms and conditions should the SWRCB include in any water right permits issued on these applications to carry out such plans?

"4. What are the likely effects of the applicant's proposed project on water quality? What permit terms and conditions should the SWRCB include in any water rights permits issued on these applications to protect water quality?

"5. How will the applicant's proposed project affect fish, wildlife, and other public trust resources? What terms and conditions for the storage, discharge, and export of water should the SWRCB include in any permit issued on these applications to protect these resources?

"6. The habitat islands are a part of the overall project and are mitigation for the reservoir islands. What water right permit terms and conditions should the SWRCB adopt to ensure that the Habitat Management Plan is implemented on a long term basis?

"7. What impacts, raised in the protests, may occur on adjacent islands, tracts, levees, utilities, and other properties and operations as a result of the applicant's proposed project? Should the SWRCB include terms and

conditions in any water right permits issued on these applications to protect these properties and operations, and if so, what should be required?

"8. Should all of the points of diversion and rediversion requested in the water right applications as amended by the petitions for change be approved? If not, which points of diversion or rediversion should be approved, and what should be the maximum capacity at each? Should any points of diversion or rediversion be restricted? If so, where, when, and why should they be restricted?

"9. Under what terms and conditions should the SWRCB authorize the applicant's proposed project to redivert stored water at the pumping facilities in the southern Delta for use south and west of the Delta? What permit terms and conditions should the SWRCB include in any water right permits issued on these applications, with respect to the proposed places of use?"

The Notice of Resumption of Public Hearing dated June 16, 2000, listed the following Key Hearing Issues. The 2000 notice pointed out that evidence received in 1997 was in the record, and that the parties should not present evidence that was repetitive of evidence received in 1997 or was available before September 1997.

"1. At what times and in what circumstances is unappropriated water available to the Delta Wetlands Project?

"2. How much water would the Delta Wetlands Project be likely to export or sell for export over a period of years, taking into account varying sequences of year types, including critical dry, dry, below average, above average, and wet years? How much water is likely to be applied to instream flows in the Delta?

"3. How would operation of the Delta Wetlands Project affect the salinity of water diverted from the Delta during periods when the Project is releasing water into the Delta?

"4. How would operation of the Delta Wetlands Project affect the organic carbon loading in water diverted from the Delta for municipal use during periods when the Project is releasing water into the Delta?

"5. How would the Delta Wetlands Project affect fish, wildlife, and other public trust resources?

"6. What are the likely effects of the Delta Wetlands Project on levee stability, seepage onto neighboring islands, and utilities in the Delta? Is it in the public interest for the SWRCB to approve the Delta Wetlands Project if it has these effects?"

4.2 Parties

In addition to DW, the following parties presented evidence in the hearing: A group including Central Delta Water Agency, Reclamation Districts 38, 2027, 2036, 2038, and 2072, M&T, Inc., CCRC Farms, LLC, and Palm Tract Farms (collectively referred to herein as CDWA); North Delta Water Agency; Pacific Gas & Electric Company (PG&E); California Urban Water Agencies (CUWA); Contra Costa Water District (CCWD); East Bay Municipal Utilities District (EBMUD); City of Stockton; United States Bureau of Reclamation (USBR); Department of Water Resources (DWR); State Water Contractors (SWC); DFG; California Sportfishing Protection Alliance and the Committee to Save the Mokelumne; Peter M. Margiotta; Amador County; and California Department of Transportation (CALTRANS). The following parties presented nonevidentiary policy statements: California Farm Bureau Federation, Natural Heritage Institute, Diablo Water District, Kyser Shimasaki, Kevin Wolf, Bay Institute of San Francisco, California Waterfowl Association, San Joaquin River Group Authority, Ducks Unlimited, Natural Heritage Institute, and Westlands Water District. In 1997, one group that had filed a notice of intent to appear (Reclamation District No. 2059, Robert C. and Jean M. Benson, Brent L. and E.E. Gilbert, and Delta Water Users Association) did not present evidence as a group. Brent Gilbert appeared individually and testified late.

The primary issues raised by the parties in 1997 were the amount and effect of dissolved organic carbon compounds produced in the DW reservoirs, levee stability and seepage in the Delta, and impacts on fish in the Delta. The parties presenting evidence in 1997 generally fell into several groups: (1) the existing entities in the Delta, including CDWA, primarily addressing levee stability and seepage issues and salinity issues; (2) PG&E, addressing impacts to its facilities on Bacon Island; (3) the municipal water users, including CUWA, CCWD, EBMUD, Diablo Water District, and the City of Stockton, addressing water quality, levee stability, and public interest issues; (4) the exporters of water from the southern Delta, including DWR, USBR, and the SWC, addressing water quality and wheeling issues and water right priorities; (5) the fish and wildlife protection interests, including DFG, Bay Institute of San Francisco, the California Sportfishing Protection Alliance, the Committee to Save the Mokelumne, and Peter Margiotta; (6) Amador County, regarding area-of-origin protections; and (7) CALTRANS,

regarding state highway rights of way. In 2000, the only parties presenting additional evidence who had not entered into settlement agreements with DW were PG&E and CDWA. Other protestants maintained their protests, but did not present additional evidence. CDWA added evidence regarding fishery protection.

4.3 Settlement Agreements

Several parties entered into settlement agreements with DW, partially or fully resolving their protests against the project. The following agreements were made before or during the 1997 hearing dates. The 1997 agreements with the parties cover water right priorities between DW and the protestants, salinity effects in the northern Delta, and impacts on the CVP and SWP operations in the Delta. The agreements between DW and DWR, and between DW and USBR are partial agreements.

- Amador County and DW agreed to support the inclusion of the following term in any and all permits or licenses issued by the SWRCB for the Delta Wetlands Project, including but not limited to permits or licenses issued pursuant to the applications considered in this decision:

  > "This permit (or license) shall be junior in priority to any permit or license issued on any application regardless of application date that authorizes the provision of water for beneficial uses within Amador County."

- The City of Stockton and DW agreed to support the inclusion of the following term in any and all permits or licenses issued by the SWRCB for the Delta Wetlands Project, including any permits or licenses issued pursuant to the applications considered in this decision:

  > "This 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 inhabitants or property owners therein."

- The North Delta Water Agency and DW agreed to request that the SWRCB include the following water quality assurance language in any permit or license issued by the SWRCB pursuant to the applications considered in this decision:

"Delta Wetlands agrees that it will not operate the Delta Wetlands Project reservoir islands if the water quality criteria for salinity in effect pursuant to the 'Contract Between State of California Department of Water Resources and North Delta Water Agency for the Assurance of a Dependable Water Supply of Suitable Quality' dated January 28, 1981, as amended, are not being met until Delta Wetlands can demonstrate, to the reasonable satisfaction of North Delta Water Agency, that Project reservoir operations are not adversely affecting salinity levels at any of the monitoring locations established by that Contract."

- DWR and DW agreed to the following three terms and conditions and requested that the SWRCB include them in any water right permits it issues for the DW Project:

"1. No diversion is authorized that would adversely affect the operation of the federal Central Valley Project or the State Water Project under permits and licenses for these Projects as they exist at the time of this Order and as they may be amended from time to time. An adverse effect shall be deemed to result from Permittee's diversion when:

"a. The USBR and the DWR have declared the Delta to be in balanced water conditions under the Coordinated Operation Agreement (COA);[1] or

"b. At any other time the diversion would directly or indirectly require the CVP or the SWP to release water from storage or reduce their diversion or rediversion of water from the Delta in order to provide or assure flow or water quality in the delta to meet any applicable federal or state law or mandate.

"2. When USBR and DWR have declared the Delta to be in excess water conditions under the COA, no diversion is authorized by Permittee greater than the amount of excess water available as reasonably calculated by USBR and DWR.

"3. Permittee shall curtail or cease discharges from Delta Wetlands' reservoirs which would directly or indirectly require operations of the SWP or CVP to be modified to meet any applicable federal or state law or mandate."

[1] Referring to "Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project, November 24, 1986," and as it may be amended.

- The USBR and DW reached a similar agreement, but since the above terms protect both the DWR and the USBR, the USBR notified the SWRCB by letter dated October 31, 1997, that it will accept the above terms instead of the terms set forth in its agreement with DW.

Shortly prior to the hearing dates on October 10, 11, and 12, 2000, DW executed agreements with EBMUD, CCWD, and CUWA. These agreements include the following terms and conditions:

- CCWD and DW agreed to the following terms and requested that the SWRCB include them in any water right permits issued for the DW Project:

"1. DWP[2] will implement and continue to operate the Project according to the WQMP,[3] 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.

"2. 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 1000 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

[2] DWP means Delta Wetlands Project

[3] The WQMP is the Delta Wetlands Water Quality Management Plan.

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.

"3. 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 Right Permits 20749 and 20750.

"4. 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.

"5. 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."

- CUWA and DW agreed to the following terms and requested that they be included in any permits issued for the DW Project.

"1. DWP[4] 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.

"2. 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:

"a. Maintenance of water quality through the WQMP;

"b. 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;

"c. Meeting water supply, water quality and environmental water requirements;

"d. Protection of the fisheries resources in accordance with the SWP and CVP OCAP,[5] and DWP aquatic species biological opinions, as they may be amended in the future;

"e. Habitat development; and

"f. Facilitating the use of the Project for a wide variety of project purposes."

[4] DWP means "Delta Wetlands Project."

[5] OCAP means "Operations Criteria and Plan."

- EBMUD and DW agreed to numerous detailed terms and conditions contained in Attachments A, B, and C of their agreement. The terms and conditions address fishery protection on the Mokelumne River, levee design and stability, and seepage control. The agreement supports inclusion of the terms and conditions in the water right permits for the DW Project.

The above terms and conditions were not opposed. Some of the above terms and conditions require editing to put them into a uniform format, to ensure that they are enforceable, to narrow their scope in the context of a water right decision, or to avoid placing the SWRCB in a conflicted position of directing operation of the project while retaining enforcement authority with respect to the project. The settlement agreements between DW and EBMUD, CCWD, and CUWA all provide that, whether or not the SWRCB includes the requested terms and conditions in water right permits issued for the Delta Wetlands Project, the parties to the agreements will be subject to and comply with the terms and conditions they specify. Additionally, DFG and DW have resolved the issues raised during the 1997 hearing dates regarding the DFG Biological Opinion through litigation and negotiations.[6]

4.4 Other Proposed Conditions

In 1997, the SWC asked that the SWRCB delay issuing permits for the DW Project and give them an opportunity to make a further showing as to the beneficial use of the water. Alternatively, SWC requested that certain conditions be included in the permits. First, SWC requested inclusion of the terms of DW's stipulation with DWR. Second, SWC requested a condition prohibiting DW from commencing construction until it produces a contract or contracts to market substantially all of the water developed by the project and a supplemental EIR has been prepared analyzing the project in light of the contracts. Third, SWC asked that DW not be allowed to use direct diversion rights to offset evaporation losses in the reservoirs. The October 10-12, 2000, hearing dates provided SWC as well as other parties an opportunity to present new evidence. SWC did not present evidence in 2000.

[6] DW requested, on September 2, 1998, that the SWRCB reopen the hearing record for the limited purpose of accepting into evidence the revised Biological Opinion for the DW Project issued by DFG on August 6, 1998. Four parties objected to accepting the revised Biological Opinion in evidence without further hearing. The SWRCB accepted the revised Biological Opinion in evidence during the October 10-12, 2000 hearing.

CDWA requested that the SWRCB include terms and conditions in any permits issued for the DW Project that are substantially similar to the provisions in a draft agreement between CDWA and DW. (CDWA 9.) CDWA and DW ceased negotiating after the February 12, 1996 draft. The draft agreement contains provisions that would establish a seepage and levee stability mitigation program, give CDWA a limited right of entry to the DW reservoir and habitat islands, establish a dispute resolution process, provide financial security to CDWA for performance of the agreement and for payment of damages, and establish a reclamation plan for each reservoir and habitat island to restore it to farmable condition or to shallow marsh habitat. (CDWA)

- In its 2000 closing brief, DW proposed several terms and conditions in addition to terms set forth in its settlement agreements. These are:

  "1. Permittee will comply with all legally binding requirements imposed under Section 401 of the Clean Water Act (42 U.S.C. . 1341.).

  "2. Permittee shall comply with mitigation measures C-1 through C-3, C-8 and C-9 of the 1995 DEIR/S.

  "3. The Chief, Division of Water Rights, may grant a variance from any of these mitigation measures after making a finding that the variance will have no significant adverse effect on the environment. Any request for a variance shall include the reasons for the variance, environmental information necessary to demonstrate that it will not adversely affect the environment, and proof that the Permittee has notified all interested parties of the request.

  "4. Permittee shall comply with all terms and conditions set forth in the January 27, 1997 Final Operations Criteria and Fish Monitoring Program as approved by the U.S. Fish and Wildlife Service, National Marine Fisheries Service and California Department of Fish and Game. Permittee may seek a variance from the final Operations Criteria upon a showing that the variance will have no significant adverse effect on the environment. Any request for a variance shall include the reasons for the variance, environmental information necessary to demonstrate that it will not adversely affect the environment, and proof of notification to and approval from the U.S. Fish and Wildlife Service, National Marine Fisheries Service and California Department of Fish and Game.

  "5. Permittee shall comply with all legally binding requirements of the U.S. Fish and Wildlife Service, National Marine Fisheries Service and California Department of Fish and Game biological opinions on the

Delta Wetlands Project required to avoid jeopardy to any listed species under the federal Endangered Species Act (16 U.S.C. §§ 1531-1544). Permittee shall comply with all legally binding requirements of the California Department of Fish and Game 2081 Agreement for the Delta Wetlands Project to avoid jeopardy to any listed species under the California Endangered Species Act (California Fish and Game Code §§ 2050-2098) with respect to the Delta Wetlands Project. The Final Operations Criteria, biological opinions and/or 2081 Agreement include the following performance criteria:

"a. Permittee shall implement fish habitat management actions to limit in-water construction activities that affect aquatic habitat from June through November, as set forth in the Final Operations Criteria and USFWS biological opinion.

"b. Permittee shall implement fish habitat management actions to replace aquatic habitat permanently destroyed by construction activities at a 3:1 ratio, as set forth in the Final Operations Criteria and DFG 2081 Agreement.

"c. Permittee shall establish an aquatic habitat restoration fund with contributions of $100 per year for additional boat berths, as set forth in the Final Operations Criteria and DFG 2081 Agreement.

"d. Permittee shall minimize and avoid adverse effects of discharge through changes in water temperature as follows: (1) when the temperature differential between the discharge and receiving water is greater than 20° F, there should be no discharge; (2) when channel water temperature is 55° F or higher but is less than 66° F, it shall not increase channel temperature by more than 4° F; (3) when channel water temperature is 60° F or higher but is less than 77° F, it shall not increase channel temperature by more than 2° F; (4) when channel water temperature is 77° F or higher, it shall not increase channel temperature by more than 1° F; and (5) Permittee shall develop and implement water temperature monitoring, as set forth in the Final Operations Criteria.

"e. Permittee shall not enter into any contractual agreements that would provide for the export of more than 250,000 acre-feet of Permittee water on a calendar-year basis so as to conform to the water transfer criteria set forth in the 1995 CVP/SWP Delta smelt biological opinions and as set forth in the Final Operations Criteria.

"f. No diversions to storage by Permittee shall violate the X2 diversion criteria for September through March, including initial filling and ramping requirements, maximum X2 locations, and maximum allowable X2 shifts, as set forth in the Final Operations Criteria.

"g. Permittee's diversions to storage shall not exceed the prescribed surplus availability of 75% to 90%, as set forth in the Final Operations Criteria. (Final Operations Criteria, Table 1: Surplus Availability.)

"h. Permittee shall dedicate a percentage of water discharged for export from December through June, less habitat island credits, as set forth in the Final Operations Criteria.

"i. Permittee shall not divert to storage from April 1 to May 31, and if the Delta smelt FMWT index is less than 239, Permittee shall not divert to storage from February 15 to June 30 (except for top-off), as set forth in the Final Operations Criteria.

"j. Nothing in the Diversion Measures set forth in the Final Operations Criteria shall limit Permittee 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 conditions set forth in the Final Operations Criteria. (Final Operations Criteria, Table 4: Maximum Topping-Off Diversion Rates.)

"k. Permittee shall not divert to storage more than 25% of Delta outflow, reduced to 15% from January through March, as set forth in the Final Operations Criteria. (Final Operations Criteria, Table 2: Outflow Diversion Limit.)

"l. Permittee shall not divert to storage more than the allowable percentage of San Joaquin River inflow from December through March, as set forth in the Final Operations Criteria. (Final Operations Criteria, Table 3: SJR Diversion Limit.)

"m. Permittee shall reduce diversions and discharges from storage when monitoring detects the presence of Delta smelt, as set forth in the Final Operations Criteria.

"n. Permittee shall minimize transport of salmon when the Delta cross-channel ("DCC") is closed for fishery protection by restricting diversions to storage when DCC is closed for fishery protection to 3,000 cfs if Delta inflow is less than 30,000 cfs, and to 4,000 cfs if Delta inflow is between 30,000 cfs and 50,000 cfs, as set forth in the Final Operations Criteria.

"o. Permittee shall not discharge for export from Bacon Island in excess of 50% of the San Joaquin River inflow from April through June. Permittee shall not discharge for export from Webb Tract from January through June. Discharges from both islands shall be further restricted by a percentage of available unused export capacity from February to July, as set forth in the Final Operations Criteria.

"p. Permittee shall meet design criteria for fish screens of 0.2 fps[7] approach velocity, as set forth in the Final Operations Criteria. Further, USFWS, USACE, SWRCB, NMFS and DFG shall approve the fish screen design criteria, as set forth in the Final Operations Criteria.

"q. Permittee shall conserve in perpetuity 200 acres of shallow water rearing and spawning habitat, as set forth in the Final Operations Criteria.

"r. Permittee shall establish a mitigation fund to compensate for incidental entrainment of eggs, larvae, and juvenile fish species, as set forth in the Final Operations Criteria and DFG 2081 Agreement.

"s. Permittee shall prepare and implement a fish monitoring plan, as set forth in the USFWS and NMFS biological opinions and DFG 2081 Agreement.

"t. Permittee shall not discharge when reservoir dissolved oxygen is less than 6.0 mg/L without prior authorization. Permittee shall not cause channel dissolved oxygen to fall below 5.0 mg/L, as set forth in the Final Operations Criteria.

"6. Permittee shall comply with the fisheries terms and conditions for the additional protection of Mokelumne salmonids, as set forth in the

[7] The term fps means "feet per second."

EBMUD Protest Dismissal Agreement Attachment A. (EBMUD Agreement Attachment A, A-1 through A-3.)

"7. Permittee shall comply with Mitigation Measures H-1 through H-3 and G-1 through G-3 of the 1995 DEIR/S.

"8. Permittee may seek a variance from these mitigation measures upon a showing that the variance will have no significant adverse effect on the environment. Any request for variance shall include the reasons for the variance, environmental information necessary to demonstrate that it will not adversely affect the environment, and proof that the permittee has notified all interested parties of the request.

"9. Permittee shall comply with all legally binding requirements of the Programmatic Agreement as issued under Section 106 of the National Historic Preservation Act among the U.S. Bureau of Reclamation, Permittee, the California State Historic Preservation Office and the Advisory Council on Historic Preservation regarding implementation of the Delta Wetlands Project, and shall comply with it as amended in the future. Permittee also shall comply with all historic property treatment plans prepared under the Programmatic Agreement.

"10. Permittee shall ensure the implementation of the habitat islands, as set forth in the HMP.

"11. Permittee shall ensure erosion protection by complying with Mitigation Measure B-1 of the 1995 DEIR/S

"12. Permittee shall adopt a final levee design that achieves a factor of safety of 1.3 or reduces the risk of catastrophic levee failure. (2000 REIR/S at 6-21.)

"13. Permittee shall submit its final levee design to the Department of Water Resources, Division of Safety of Dams for review and approval if Permittee is intending to store water above +4 feet MSL, as established by the USGS 1929 datum. (Water Code § 6004(c).

"14. Permittee shall implement seepage control measures as set forth in the Project description, which shall address the concerns of Impact D-2, including:

"a. No borrow area shall be located closer than 800 feet from the toe of the levee on the reservoir islands when the adjacent islands could be impacted.

"b. Installation of interceptor wells, relief wells or implementation of some other engineering design to maintain the hydraulic heads beneath the levees of the adjacent islands within existing conditions.

"15. Permittee shall comply with the mitigation measure listed in Table 7-1 of the 2000 Revised Draft Environmental Impact Report/Statement which is to ensure that line 57-A is securely anchored before Bacon Island is flooded.

"16. Permittee shall comply with the mitigation measure listed in Table 7-1 of the 2000 Revised Draft Environmental Impact Report/Statement which is to:

"a. Monitor locations where gas pipelines cross Bacon Island levees during and after levee construction; and

"b. Implement corrective measures to reduce the risk of pipeline failure during levee construction.

"17. Permittee shall comply with the mitigation measure listed in Table 7-1 of the 2000 Revised Draft Environmental Impact Report/Statement which is to provide adequate facilities on Bacon Island for annual pipeline inspections and to relocate the cathodic protection test stations before Bacon Island flooding.

"18. Permittee may seek a variance from these mitigation measures upon a showing that the variance will have no significant adverse effect on the environment. Any request for variance shall include the reasons for the variance, environmental information necessary to demonstrate that it will not adversely affect the environment, and proof that the Permittee has notified all interested parties of the request.

"19. The water appropriated under this permit shall be limited to the quantity which can be beneficially used and shall not exceed [see attached Table 14 of Exhibit DW-8 for specific limitations on maximum rates of direct diversion and diversion to storage, combined maximum appropriation, season of diversion, place of use, and purpose of use for each application, including relevant change petitions which have been filed].

"20. The issuance of this permit shall not limit or be construed to limit, in any way, Delta Wetlands' existing water rights on any of its four islands.

"21. Permittee shall include in a contract for sale a provision that the purchaser must enter into the appropriate statewide memorandum of understanding that guides water conservation practices."

5.0 WATER RIGHT CONSIDERATIONS

As explained above, numerous issues regarding the DW Project have been resolved between the parties through agreements on terms and conditions. The unresolved issues concerning effects on other water right holders, on neighboring islands, on the state highway, and on PG&E's gas lines can be mitigated through additional terms and conditions on the operation of the project, as discussed below.

5.1 Beneficial Use of the Water

Beneficial use is a necessary element of a water right. (Wat. Code § 1240.) Factors in determining whether water will be beneficially used include the cost of the water and the demand for new water supplies. If demand exists and different water supplies are available to buyers, the cost of the water will influence whether it will be beneficially used. DW has presented no evidence that it has any buyers for the project water. Unless someone buys the water or the project, there will be no beneficial use of the water. The potential exists for the DW Project water to be beneficially used because the existing demand for water in California is not met in most years. In addition, CALFED has expressed interest in in-Delta water storage, for both fishery benefits and enhanced water project flexibility. (DW 87, p. 5, Modified Figure 3-8; DW 91, pp. 7-8; S-R.T. p. 191; DW 101, pp. 10-12.)

The settlement agreements between DW and CCWD, and between DW and CUWA, improve the chances that DW will be able to sell water to suppliers of municipal water. The most likely customers for the water or water rights to the Delta Wetlands Project are DWR or USBR, or a municipal water supply contractor of one of these projects. DW presented evidence that DWR and the USBR are considering whether to buy the project to enhance their operations in the Delta. (DW 82; DW 101, pp. 10-12.)

The cost of the DW Project water will be a major factor in selling either the water or the project. In 1997, DW estimated the cost of water at $200 to $300 per acre-foot plus conveyance charges and costs due to mitigation and operational limitations. (R.T. pp. 582-583; DW 82, p. 37.) In 2000, DW presented evidence that the water could be marketed if (1) the cost were kept in the range of other comparable projects, that is, within a range of $260 to $700 per acre-foot, and (2) DW or a buyer of the DW Project could produce water for sale in this range. (S-R.T. pp. 181-182, 389-390; DW 98, p. 1.) At

the price DW estimates, agricultural water users are unlikely to buy water from the project. (R.T., p. 1330.)

The USBR estimates that if it buys the project and constructs it at a combined cost of $348 million, the USBR can produce water at a cost of $209 per acre-foot of water, with an annual operation and maintenance costs of $6 million and a average water supply yield of 142,000 acre-feet per year. In a test of sensitivity of the costs and water supply capability, the USBR increased construction and operation and maintenance costs and reduced the average annual water supply by 25% which resulted in a average cost per acre foot of $336 and a yield of 110,000 acre-feet. (DW 82, p. 37.)

To ensure that any water diverted to storage for the DW Project is used beneficially, the permits will be conditioned to require a buyer or buyers of the water or water rights to be identified before the reservoirs are filled about mean sea level.

5.2 Water Availability And The Interconnection To Project Yield

The SWRCB must determine that water is available for appropriation prior to issuing a permit for a proposed project. Water availability is an integral part of project yield. Factors that affect water availability in the Delta include hydrology, limitations on pumping in order to protect prior water rights, water quality, fish and wildlife, and other limitations imposed by agreements reached as part of negotiations with protestants, unmet demand, and pumping capacity to export water to areas south of the Delta. The diversion factors, along with other constraints, affect the DW Project yield. Project yield is also dependent on unmet demand for the water and the location of the potential recipient of the water. For instance, if there is a demand for DW Project water south of the Delta but there is no available pumping capacity, the DW Project water cannot be delivered for beneficial use and must be held over until pumping capacity is available. This reduces the potential yield of the project by limiting the available storage the next year.

The REIR/EIS analysis suggests that there will be water available for diversion to storage not only during and after winter storms when high flows are present in the Delta, but also occasionally in the drier months. No water is available during April and May because of fish protections. However, in all other months the analysis shows that some water will be available in at least some years. The analysis

predicts that the largest average amounts of water would be available in November through March. (SWRCB 2A, Table 3-11.)

5.2.1. Constraints And Mitigation Measures Impacting DW Project Yield

The settlement agreement between DW and CCWD protects CCWD's water quality and senior water rights. In order to meet the Endangered Species Act requirements, CCWD cannot divert water under its water right permits when the location of the two parts per thousand salinity line (X2) in the Delta is upstream of the points specified in the biological opinions for Los Vaqueros Reservoir.[8] If CCWD violated the Endangered Species Act requirements, it would also violate its water right permits. Furthermore, CCWD's permits prohibit diversions from the Delta when the DWR and the USBR declare the Delta to be in balanced conditions [9] under the Coordinated Operation Agreement, or at any time when CCWD's diversion would cause the CVP or SWP to release water from storage or reduce their diversions from the Delta to meet flow requirements. Consistent with the settlement agreement, the permits for the DW Project will be conditioned to constrain diversions by DW based on the location of X2 in the Delta, and the DWP Project permits will be junior in priority to CCWD's permits 20749 and 20750 when the Delta is in balanced conditions.

The permits for the DW Project also will be subject to terms and conditions from the settlement agreements between DW and the DWR, and between DW and the USBR, to protect the water supplies and senior water rights of the SWP and CVP. These agreements effectively preclude diversions to storage by the DW Project when the state and federal projects calculate that unappropriated water is not available, as well as preventing discharges by the DW Project when discharges of stored water would require changes in SWP or CVP operations to meet state or federal mandates. Additionally, the permits for the DW Project will be subject to certain terms and conditions based on the settlement agreements with City of Stockton, Amador County, North Delta Water Agency, EBMUD, CCWD, and CUWA. Finally, the permits will contain terms and conditions to protect the water quality for other water users in the Delta, during both diversions and releases of the DW Project water.

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[8] See section 6.2.1, below, for a more complete explanation of the X2 restriction.

[9] Balanced water conditions are periods when it is agreed by the CVP and SWP that releases from upstream reservoirs plus unregulated flow approximately equal the water supply needed to meet Sacramento Valley inbasin uses, plus exports.

The X2 restrictions, plus the restrictions in the biological opinions for the DW Project will have the greatest impact on diversions. Some of the restrictions in the DW biological opinions will further reduce the opportunities of the DW Project to divert or release water at times when diversions or releases would be injurious to fish, for instance, when protected fish are present during the fall and winter.

The above factors all affect water availability in some measure. The REIR/EIS attempted to incorporate all quantitative terms of the (1) final operating criteria; (2) USFWS, NMFS, and DFG biological opinions, and (3) stipulated agreements into its modeling to determine yield.

5.2.2. Availability of Conveyance Capacity for Export South of Delta

In order for the DW Project to export water south of the Delta, it must use the export pumping and conveyance facilities of the CVP or the SWP. To sell water for export south of the Delta, the DW Project must secure unused conveyance capacity from the CVP or SWP at the times when a customer wants water. Alternatively, the DW Project could make arrangements with the CVP or SWP to deliver state or federal project water to a DW Project customer in exchange for stored DW Project water, which the CVP or SWP could use at another time to optimize their operations.

The REIR/EIS modeled export capacity using the DWR's DWRSIM planning model, which calculates, among other things, the availability of unused and permitted CVP and SWP export pump and canal capacity. The modeling study shows that from June through September, when DW exports are likely, unused pumping capacity exists that would allow the DW Project to export its projected storage capacity of 238 TAF in most years. In 9 of the 73 years of study (12% of years) unused pumping capacity in the combined CVP and SWP project is substantially less than 238 TAF and would result in limited delivery of DW Project water to their potential buyers. During some years, less water is available to DW. If the conveyance capacity limitation and the limitation of available water for diversion into the DW Project are combined, the water supply potential is reduced in 35% of the years simulated. (SWRCB-2A, pp. 3-21 to 3-22, tables 3-11, 3-12.)

Before filling the DW Project reservoirs above mean sea level, the Permittee will be required to show that the water developed by the project can reliably be wheeled.

5.2.3 Modeled Estimates of Water Availability and Project Yield

The analysis in the REIR/EIS provided estimates of monthly water availability and project yield using a revised Delta Standards and Operations Simulation (DeltaSOS) model, which was developed by the REIR/EIS consultant. The DeltaSOS simulations were based on a revised Delta water budget developed by DWR using its operations planning model, DWRSIM. In addition, the REIR/EIS uses a daily operations model, DailySOS, to confirm the adequacy of the DeltaSOS analysis.[10] (DW 87; SWRCB 2A, pp. [3-3]-[3-4].)

The REIR/EIS discusses three modeling studies at different demand levels. The first study shows an estimated average annual yield of 138 TAF. This study assumes the following:

- The 1995 water quality control plan is in place;
- The FOC from the biological opinions are implemented;
- All existing facilities in the Delta are in place; and
- All water is put to beneficial use subject only to availability of SWP/CVP pumping capacity.

The second REIR/EIS modeling study was similar to the first except that it makes the assumption that export demand was limited to the 1995 level and resulted in 114 TAF of average annual yield. The third REIR/EIS modeling study was conducted with the assumption that future capacity for pumping would become available in the Delta and that there are not limitations on demand. This study resulted in 147 TAF of average annual yield.

[10] The model runs evaluate the frequency, timing and amount of water available to the project and take into consideration the following: updated DWRSIM results from technical studies prepared in support of the CALFED no-action simulations; upstream and in-Delta actions resulting from implementation of the Central Valley Project Improvement Act (CVPIA); terms of the Final Operations Criteria (FOC) and the USFWS, NMFS, and DFG biological opinions for the DW Project; DW's settlement agreements with the Bureau of Reclamation, DWR, Amador County, the City of Stockton, and North Delta Water Agency; and the X2 restriction to preserve CCWD senior water rights which is consistent with the X2 restriction on CCWD operations described in the 1993 USFWS biological opinion for Los Vaqueros Project effects on delta smelt.

DW presented evidence that the three operating scenarios modeled in the REIR/EIS, did not represent the full yield of the project. (DW 91, pp. 5-6.) DW conducted an independent analysis to estimate the yield of the project. Using the yields of two of the three operating scenarios in the REIR/EIS, DW performed a sensitivity analysis on the various modeling assumptions used in the REIR/EIS analysis in order to better understand the full potential yield of the project. This resulted in an average annual yield of 165,000 to 175,000 acre-feet per year.[11] (DW 91, pp. 6-7.)

The USBR conducted an assessment of potential feasibility of the DW Project, including water supply capability and operational flexibility. The USBR published its findings in April 2000 in its Delta Wetlands Appraisal Report. The USBR identified six potential sources of water to be stored in the DW Project, including water transfers, environmental flow, facility re-operation, surplus delta outflow, foregone irrigation, and fine-tuning of CVP operations. The USBR estimated the yield to be in the range of 110 TAF to 142 TAF under varying assumptions. (DW 82, pp. 13-14; 35-36.)

5.2.4 Constraints To Yield Which Could Not Be Modeled

Originally, the DW Project average yield was estimated at 235,000 acre-feet per year. DW's current estimate of 175 TAF is based on an assumption that any approval of the project issued either by the SWRCB or the USACE will impose no additional terms and conditions that affect yield over and above the impacts of the mitigation measures in the draft EIR, the impacts of the state and federal biological opinions, and the stipulated agreements. The SWRCB will impose conditions on the project in addition to the mitigation measures recommended in the EIR, to address matters that involve other water rights and the public interest. These terms and conditions, and other factors, could have a substantial, undetermined impact on project yield.[12]

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[11] This estimate of yield is based upon the following assumptions: The demand is not limited, as DW believes this is more representative of future use. It uses the 10 years of daily hydrology contained in the RDEIR/EIS, extrapolated over 27 years. It assumes a useful life of the DW Project of 50 years. It assumes a maximum storage level of +4 feet resulting in a storage capacity of 230 TAF. It assumes presence of fish in channels adjacent to the project for half of the January through June period, reducing diversion and discharge rates by 50%. It assumes a San Joaquin River inflow limitation is triggered 15 days per year. It assumes that the Delta smelt FMWT index would be triggered for 8 out of the last 31 years and therefore yield impact is prorated by 26%. (DW 91, p. 6-7, Table 1; S-R.T., pp. 86-95.)

[12] Factors which could influence project yield include: (1) using project water for delivery to a place of use other than south of the Delta; Delta smelt fall mid-water trawl (FMWT) index restriction which cannot be accounted for in the model simulations; (2) potential for new constraints on operations as a result of the annual Water Quality

continued

5.2.5 Summary And Conclusion On Yield And Water Availability

The various modeling studies resulted in a range of estimated yield from a high of 175 TAF to a low of 114 TAF. Some of the factors that could impact yield could not be effectively modeled. While the analyses do provide an estimate of project yield given the various operating constraints, some modification of these constraints is likely and could result in lowering or raising the yield of the project. Although these factors present uncertainties, the SWRCB finds that water will be available for diversion to the DW Project during some high flow periods.

6.0 WATER QUALITY CONSIDERATIONS

The effect of the DW Project on water quality was a major issue in the hearing. Many water quality parameters could be affected by the DW Project. Several parties raised issues regarding two distinct and interconnected components: salinity and organic carbon. Salinity is a water quality parameter that and organic carbon molecules are treated with various chemical agents in the municipal water treatment process, THMs and HAAs, also known as disinfection byproducts (DBPs), are formed. Many DBPs are directly affects beneficial uses of water. Salinity also contributes to the formation of precursors of groups of molecules which include trihalomethanes (THMs) and haloacetic acids (HAAs). When salts carcinogenic and possibly abortion-causing. As discussed below, the evidence shows that during storage there will be an increase in the concentration of both salts and organic materials that are DBP precursors in the water stored in the DW Project reservoirs. The settlement agreements between DW and CUWA, and between DW and CCWD, are designed to prevent degradation of receiving water quality by regulating both the diversion to storage and the release of water from storage in the DW reservoirs. (CCWD 25; DW 105.)

The core of the agreements between CCWD and DW, and between CUWA and DW, is a Water Quality Management Plan (WQMP). (DW 105, Ex. B.) The WQMP includes a set of screening criteria that define acceptable maximum water quality impacts caused by DW operations, and calls for the formation

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Management Plan (DW 87, pp. 7-8.); (3) avoidance of inadvertent diversions; (4) levee design and construction including the likelihood of storing water at plus 6 feet above mean sea level (A lowering of the maximum water storage level to plus 4 feet above mean sea level would reduce the project yield by approximately 20,000 afa per foot of elevation. (R.T., p. 579.)); (5) additional water quality constraints on discharge of DW water to meet waste discharge requirements under the Porter Cologne Act or NPDES Permit under the Federal Clean Water Act, (6) unforeseen high concentrations of TOC in DW Project reservoirs, making discharge at assumed rates and times not possible; (7) more stringent requirements of the Safe Drinking Water Act.

of an advisory panel, composed of representatives of the parties and the SWRCB, to prepare an Annual Operating Plan (AOP).

The WQMP identifies short-term operational screening criteria that are partly based on either established regulatory standards or a mean value for water quality parameters without numerical limits. The WQMP significance criteria include a safety margin, or significance threshold, that accounts for natural variability, measurement errors and modeling uncertainties. The criteria assume that DW Project water will be used as a raw source for drinking water treatment plants. The AOP will define a final computer model to simulate water quality impacts caused by DW Project operations. The AOP final computer model will be used not only to manage DW Project operations (i.e. to predict and prevent violations of the screening criteria), but also to determine the cause of any violations. The AOP will define in detail general and short-term operating principles, a comprehensive monitoring program, and long and short-term mitigation requirements. The AOP is outlined in the WQMP.

It is the policy of the SWRCB to ensure in any of its water right or water quality actions, that the policy set forth in Resolution 68-16 is followed. Resolution 68-16 provides in pertinent part:

> "1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies."

Applied to the water right applications for the DW Project, Resolution 68-16 means that before the SWRCB will approve the water right applications, the SWRCB must be satisfied that storage of water on DW Project reservoirs and subsequent releases of water into the Delta either will not adversely affect the quality of water in the Delta channels when it is released, or that any reduction in water quality will "be consistent with maximum benefit to the people of the State, [and] will not unreasonably affect present and anticipated beneficial use of such water...."

Due in part to the settlement agreements, the SWRCB is able to make the above finding. The settlement agreements represent the interests of the municipal water users who would receive the released water.[13] To ensure that the DW Project does not impact other beneficial uses of water by adversely impacting water quality, this decision requires that the project meet water quality objectives in water quality control plans.

6.1 Dissolved Organic Compounds

Water stored on the DW reservoir islands will be enriched with dissolved organic compounds. (SWRCB 2a, Chap. 4.) The organic content of the water, plus the use of certain disinfectants in water treatment processes, causes the formation of DBPs in drinking water. Humic and fulvic acids, which are among the dissolved organic compounds, are the primary precursors of DBPs. Therefore, dissolved organic compounds are the primary water quality parameter of concern with respect to DPBs. A determination of the concentration of dissolved organic carbon (DOC) is used as a surrogate for measuring the concentration of dissolved organic compounds, including humic and fulvic acids.

Organic carbon loading is generally expressed in parts per million of either total organic carbon (TOC) or DOC. TOC consists of both DOC and particulate organic carbon (POC). POC includes diatoms and other microalgae, dead algae, bacteria, microzooplankton, and decomposing plant material. For purposes of the DW Project, TOC and DOC are nearly interchangeable: DOC represents more than 90 percent of the TOC present in Delta waters (CCWD 4, p. 10; R.T., pp. 485-486, 1067.) The primary cause of TOC enrichment of stored water will be a mass transfer of organic carbon from the peat soil in the DW Project reservoir islands to the stored water.[14] (SWRCB 2, App. C-5, Table C5-3; R.T., pp. 425-426; DW 13, Fig. V-5; R.T., pp. 2779-2780.)

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[13] Because any increases in dissolved organics would result in increased treatment cost during the time when DW releases the water, the most likely users of water from the project, urban water suppliers, objected to the project during the 1997 hearing. At that time, they asserted they would not buy the water and did not want to receive it as part of the water delivered to them by DWR or USBR. Due to the settlement agreements signed by DW with CUWA and CCWD, it appears that these parties now will be willing to receive water from the DW Project.

[14] Diffusion of TOC that exists in the pores of the peat soil on the reservoir islands will be the primary cause of TOC loading to stored water. Temperature, the relative difference in TOC concentration between soil and stored water, and the surface area of the DW Project reservoirs will affect the loading rate. The TOC concentration in stored water will depend on the average length of contact time with the soil and the volume of stored water. A second source of TOC concentration in stored water is evaporative losses. A third source of increased TOC in stored water will be the growth of aquatic plants under shallow storage conditions followed by decay under near capacity storage conditions. continued

Typically, water treatment involves a series of physical and chemical processes. Typical chemical processes include chlorination with a variety of agents and ozonation. In conventional water treatment, raw source water is treated through physical processes before any of the chemical processes that produce DPBs. The Safe Drinking Water Act (SDWA) regulations specify the percentage removal of TOC that must be achieved through physical processes (such as coagulation and softening) to reduce DPB precursors before chemical disinfection. (42 U.S.C.A. § 300f, et seq.) Additionally, the regulations specify the maximum contaminant level for total trihalomethanes in drinking water. (See 40 CFR, Part 141.) Urban water suppliers such as CCWD and CUWA's other members must comply with the limits established in the regulations. Their ability to comply is affected by the quality of raw water they receive.

6.1.1 Changes in TOC as a Result of the Project

The water will increase in TOC while it is stored, at least during the early years of the project, because of leaching from the peat soils on the floors of the reservoirs. During the release period (primarily July, August and September) in many years, TOC in released water could be higher than in the receiving water. (SWRCB 2, App. C-5, Table C5-3; R.T., pp. 425-426; DW 13, Fig. V-5; R.T., p. 2779-2780; SWRCB 2a, pp. 4-25; R.T. pp. 507-509, 2545.) If project water were released at the rate of 1000 cfs or 10 percent of the total assumed export rate, the average increase in DOC, taking into account reductions in agricultural loading of approximately 2.0 mg/L, would be about 0.2 mg/L.[15]

Some experiments have been conducted to estimate the amount of DOC that would be released from flooded Delta islands, using tanks and limited areas on Delta islands. The experiments were conducted over a period of a few months and are discussed in the DEIR/EIS and REIR/EIS. (SWRCB 2, App. C-3; SWRCB 2a, pp. [4-17]-[4-26].) None of the results are directly related to what will occur in the DW Project reservoirs, especially after multiple years of storage. DW argues that the experiments indicate that levels of DOC tend to level out rapidly, at low concentrations. Other parties argue that the experiments took place over too short a duration to establish the maximum possible equilibrium

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Wind-induced re-suspension of material under shallow water storage conditions is another source of increased TOC in stored water.

concentrations, and that because some experiments were conducted in winter months, the lower temperatures resulted in reduced DOC loading rates. (CUWA 5, p. 20.) The extrapolations of the data to multiple-year storage situations do not appear justified. (CUWA 4, p. 6.)

The DW Project is likely to increase average export DOC concentrations during periods of DW discharges, accompanied by slight decreases in export DOC concentrations during periods of diversion to storage.[16] (SWRCB 2a, Table 4-20.) Water quality modeling discussed in the REIR/EIS indicates that there were significant increases in DOC concentrations at the export locations in 15 of 73 simulated water years. The degraded water quality would require mitigation. (SWRCB 2a, pp. 4-42; Table 4-20.)

Cessation of agricultural operations on the DW islands could reduce DOC loading to the Delta. (R.T., pp. 171-173.) Fertilizer use would also be significantly reduced. (R.T., p. 179.) It is unlikely, however, that the average annual loading savings from cessation of agricultural return flows would offset increased DOC loading from DW Project operations. During discharge periods, DW Project operations could result in significant increases in DOC concentrations at the Delta export locations, including CCWD's Rock Slough Pumping Plant, CCWD's Pumping Plant on Old River, the SWP Banks Pumping Plant, and the CVP Tracy Pumping Plant. (SWRCB 2a, Table 4-24.)

Residence time will affect the amount of TOC loading in reservoir water. Stored water could remain on the islands longer than the median length of eight months suggested by the DW cycle of intended operation. During wet periods, or when export pumping capacity is limited, discharge rates from the DW reservoir islands could be limited, and therefore residence times would increase. Additionally, during the early years of operation when TOC and other water quality parameters could be high, discharge rates from the DW reservoir islands could be limited, and therefore residence times again would increase. Even with a long-term decrease in the rate of TOC loading, evaporation would tend to increase both TOC and salinity concentrations.

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[15] This assumes that the loading during storage and evaporation would be equivalent to the estimated present agricultural loading of 2.0 mg/L.

[16] The timing of the DOC loading to the Delta channels will change, compared with current agricultural uses of the reservoir islands. DOC loading from agriculture currently occurs primarily in winter. With DW Project operations, the loading from the reservoir islands will shift to summer. If water is diverted from Delta channels onto the continued

6.1.2 Loadings of DOC from Initial Fillings

Depending on the length of time of the initial storage cycles, the reservoir islands could build up substantial loadings of DOC and other constituents that, when discharged, could result in violations of drinking water standards in exported treated water even if the discharge was made under high flow conditions.[17] Repeated filling and emptying of the DW reservoir islands may eventually leach out most of the soluble organic material. If new plant growth is minimized, annual DOC loading may decline. The first few fillings, however, may have very high levels of DOC, plus residues from pesticides and other island wastes. (R.T. pp. 2549 - 2552.) The opportunities to release the early fillings may be few. One option would be to release water from the islands at a very slow rate,[18] under winter flood conditions, when there is positive (toward the ocean) flow in Old and Middle rivers. (CUWA 2, pp. 11-12.) Under this option, emptying the reservoirs could take several months or even several years. Even with tight restrictions, releases from Bacon Island could still impact the quality of water at the intakes for the SWP and for CCWD in the southern Delta.

6.1.3 Stirring of Organic Material During Emptying of Reservoir Islands

After several years, relatively low concentrations of DOC may leach into the stored water from the underlying peat soils, especially when the reservoirs are full. When the reservoirs are drawn down, however, concentrations of TOC may increase in the remaining water as wind stirs up the bottom. If the water is very shallow, wind action could form a slurry of water, peat, silt and other materials. (CUWA 10, p. 8; R.T., pp. 2402 - 2404, 952 - 954.) If this water cannot be released because of TOC, turbidity, temperature, or other constituents, it could substantially affect project yield. Each foot of water not released from the reservoirs (or not stored) will decrease project yield by approximately 10,000 acre-feet. (R.T., p. 479.)

DW Project reservoirs early in the fall and winter, it may have relatively high initial TOC concentrations due to agricultural discharges.

[17] An experiment on wetland flooding showed a rapid rise to high DOC levels, and while it produced a higher concentration than might be expected in a filled reservoir, it indicates the type of reaction which could occur in the early years of the project. (SWRCB 2, Appendix C3, pp. C3-6 to C3-8.) If it is assumed that the initial DOC load is 9g/m^2/month on the DW reservoir islands, computer simulations indicate significant increases in average export DOC concentrations during 48 of the 73 simulated water years, requiring mitigation. (SWRCB 2a, p. [4-42] and Table [4-24].)

[18] A discharge rate maximum of 10 percent of Old and Middle rivers flow was suggested during the hearing.

6.1.4 Shallow-Water Habitat and DOC Production

The DW Project includes the possibility of establishing shallow-water habitat on the reservoir islands when they cannot be filled. (R.T. pp. 259 - 260; SWRCB 2a, Table 2-1.) The purpose of the habitat would be to provide food and cover for waterfowl for hunting purposes; however, the habitat is not part of the wetlands mitigation requirements.

The evidence regarding the effect on TOC concentrations of creating shallow-water habitat is inconclusive. On the one hand, keeping the soil moist on the reservoir islands, as would occur during storage as well as during the shallow-water flooding proposed during non-storage periods, would reduce loss of peat soil due to oxidation, and would also reduce release of DOC into the pore water of the peat soil. (DW 13, p. 115.) On the other hand, the shallow flooding would encourage the growth of shallow water plants (emergent vegetation), which will decompose when the reservoirs are filled.[19] At an average depth of about one foot, considerable aquatic plant growth is likely. Consequently, in the presence of shallow water, the reservoir islands would produce a continuing source of new DOC, at least partially offsetting the benefits of reduced peat oxidation. DOC loading will be less if the DW Project does not establish seasonal wetlands on the reservoir islands. (R.T. pp. 2568 - 2571; 2812 - 1813.)

6.1.5 The Water Quality Management Plan and EPA Requirements

Pursuant to the federal SDWA (42 U.S.C.A. §§ 300f to 300j-26.), the U.S. Environmental Protection Agency (EPA) has established the current maximum contaminant level for total trihalomethanes in drinking water at 0.10 mg/L for community water systems that serve a population of 10,000 people or more. (40 CFR. § 141.12.) This regulation will remain in place until December 16, 2001. Compliance with this regulation is to be calculated pursuant to 40 CFR § 141.30. The regulation specifies maximum contaminant limits (MCLs) for four classes of DBPs, namely TTH and HAA5, chlorite and bromate. The MCLs are as follows:

DPB Constituent	TTHM	HAA5	Chlorite	Bromate
MCL (mg/L)	0.080	0.060	1.0	0.010

[19] Some evidence suggests that much of the increase in DOC is due to degradation of plant material rather than leaching from peat. Other evidence suggests that more DOC could result from peat than from wetlands. (CUWA 5, p. 19.)

The restrictions apply to treated water, but can more readily be met if the source water has minimal concentrations of TOC and DOC. In addition, the level of salinity in the water affects formation of trihalomethanes. If the DW Project incrementally increases the amount of TOC and salinity in the source water, the operation of the DW Project will add to treatment costs.

The WQMP includes a general framework of criteria that define the maximum acceptable water quality impacts from DW discharges. The WQMP limits the total contribution from DW reservoir island discharges at the urban intakes to a maximum 25% of the combined export pumping at the Banks and Tracy pumping plants. The WQMP assumes that Delta export waters are used directly as a raw source for drinking water treatment plants. (DW 82, p. 19.) The WQMP identifies short term operational screening criteria for TOC, total trihalomethanes (TTHM), chloride and bromate. If the criteria are exceeded, DW Project operations may be subject to constraints if project operations cause the exceedances. The WQMP screening criteria for TOC, based on real-time monitored or model simulation predicted concentrations, are as follows:

- A TOC concentration at the Delta export locations (urban intakes), or at a water treatment plant in excess of 4.2 mg/L;
- A TOC concentration increase at the Delta export locations (urban intakes) higher than 1.0 mg/L.

The SDWA regulations do not place a limit on the TOC concentration of raw source water for treatment plants. Rather, the regulations specify TOC removal percentages (prior to any disinfection steps) for different types of water treatment systems, and a range of alkalinities. Raw source water alkalinity is a water quality parameter that determines the efficiency of TOC removal processes (such as enhanced coagulation) used in water treatment plants. The SDWA regulations list a range of 2-4 mg/L as the lowest TOC concentration requiring removal of TOC. (40 CFR § 141.135(b).) The SWRCB finds that the WQMP TOC criteria will ensure protection of drinking water quality from DW operations.

The WQMP sets screening criteria for the calculated TTHM and bromate that will be derived from the raw source water arriving at the Delta pumping plant. The WQMP provides that if the treated water at the outlet of a treatment plant will exceed the concentration of TTHM and bromate set forth below, then emergency procedures will be triggered.

DBP Constituent	TTHM	Bromate
Screening criterion concentration exceedance (mg/L)	0.064	0.0084

The WQMP does not identify screening criteria for HAA5 and chlorite. Exceedance of WQMP screening criteria would trigger operational constraints only if the AOP model simulations demonstrate that such exceedances are caused by DW releases. The monitoring for TTHM and bromate at the pumping plant apparently is intended to establish a baseline for the incremental increase in these constituents after the treatment plant.

The AOP will define general and short-term operating principles, a comprehensive monitoring program, and long and short-term mitigation requirements. The AOP is only outlined in the WQMP. The remaining disagreements among the parties on TOC loading rates and other issues will have to be addressed in the AOP. The AOP will include a detailed and comprehensive monitoring program. Monitored parameters will include TOC, bromide, total dissolved solids (TDS), chloride, UVA, DO, turbidity and temperature. The sample locations, sampling frequency, analytical methods and quality assurance/quality control procedures are some of the aspects of the monitoring program that need to be presented in detail in the AOP.

Although the WQMP provides an approach to resolving issues regarding DBP precursors in DW Project water, it does not establish a set of enforceable criteria for regulating the operation of the DW Project discharges when they contain TOC or other DBP precursors at levels exceeding the receiving water. The WQMP also does not address HAA5 and chlorite, the two other classes of DPBs with enforceable MCLs in the EPA regulations. Finally, the WQMP allows water treatment plant owners to waive their protections under the WQMP, notwithstanding that an increase in TOC could be contrary to the public interest. It is in the public interest to ensure that drinking water quality is not adversely affected by the DW Project discharges. Therefore, to establish an enforceable water right permit term that protects the public interest, this decision requires that DW Project operations shall not cause an exceedance of any of

the MCLs set forth in the EPA regulations at the exit of the receiving water treatment plants. This term will require compliance with future changes in the EPA requirements under the SDWA. This decision also requires the Permittee to submit a monitoring and compliance plan to the Chief, Division of Water Rights, for approval, and to file monitoring reports.

As discussed, the DW Project could cause significant increases in DOC concentration in Delta water exports and THM concentrations in treated drinking water. The mitigation measures required in this decision will reduce the significant environmental effects of the DW Project on DOC concentrations in Delta water exports and on direct and cumulative increases in THM concentrations in treated drinking water to a less than significant level.

6.2 Salinity Impacts

Discharges of water from the DW reservoirs could cause degradation of water quality in the channels of the Delta in some years. The modeling discussed in the DEIR/EIS suggests increases of up to 50 mg/L chloride might occur in export water during the discharge period. (SWRCB 2, Figure 3C-18.) Salinity increases in the Delta caused by DW Project discharges could adversely affect municipal and agricultural water supplies.[20]

6.2.1 Salinity Intrusion

DW's high diversion rates during filling could reduce Delta outflow, allowing the head of the saline wedge of ocean water in the estuary to move farther upstream than would otherwise occur. This movement is measured as an increase in X2, an index value defined in the Monismith equation as the distance in kilometers above the Golden Gate of two parts per thousand (ppt) bottom salinity.

[20] The draft EIR/EIS indicates there will be a significant adverse effect if a DW discharge causes a salinity increase equal to 20 percent of the numerical water quality objective, or if the discharge causes the receiving water to exceed 90 percent of the numerical objective. (SWRCB 2, pp. [3C-20] - [3C-21].) The environmental documentation uses this criterion because a combination of natural variations in the system, plus inaccuracies in modeling operational effects, might provide sufficient "noise" in the system that water quality changes of less than 20 percent of the standard could not be unequivocally attributed to the effects of DW operations. (SWRCB 2a, pp. [4-30] – [4-34].) Under this significance criterion, a change from 50 mg/L chlorides to almost 100 mg/L is not treated as significant, since such a change is less than 20 percent of the current 250 mg/L chlorides objective at Rock Slough (R.T., pp. 283-290). This change in salinity in the Delta channels, however, could result in poorer quality water for CCWD, negating the water quality improvements provided by Los Vaqueros Reservoir (LVR). The Los Vaqueros intake is on Old River. The purpose of LVR is to divert and store fresher water to blend with saltier water diverted at Rock Slough.

(R.T., pp. 349 - 356.) A higher value indicates that salinity has penetrated farther up the estuary. An increase in X2 could impact the water quality of water used by CCWD, the City of Antioch, and several industries, as well as the state and federal pumps in the southern Delta. (CCWD 3, pp. 2-3; CCWD 4, p. 6.)

CCWD's water rights are senior to the DW Project. CCWD's authority to divert water under its own water rights is dependent on the location of X2 in the Delta, due to a requirement in CCWD's permits for the Los Vaqueros Project that CCWD comply with constraints imposed under the Endangered Species Act. The federal biological opinions for the DW Project could, under certain circumstances, allow Permittee to divert water to storage when CCWD could not divert water to Los Vaqueros Reservoir. (CCWD 3, p. 11.) DW Project operations under the FOC, and the settlement agreement between DW and CCWD, will minimize salinity increases in Delta channels and the export facilities during filling of the reservoir islands. (DW 3, pp. 3-8; DW 105, p. 4.) A combination of X2 location requirements and diversion rates and ratios, and other restrictions, will preclude the DW Project from diverting water to storage when CCWD's Los Vaqueros Project biological opinion prohibits CCWD from diverting. In addition, a term in the 1998 DFG biological opinion designed to minimize the adverse impacts of take of winter-run salmon and delta smelt may provide additional salinity protection. This provision reduces DW Project diversions to 550 cfs unless QWEST (a calculated measure of net flow between the central Delta and the western Delta) remains positive. (DW 77, p. 43.)

6.2.2 Quality of Diverted Water

The second salinity issue addresses the quality of the water that DW would divert onto the reservoir islands. The quality of water diverted is important because it affects the quality of the water subsequently discharged from the reservoirs. DW proposes to fill the islands with surplus flows primarily in the late fall and winter months when storms provide surplus flows. (CCWD 4, Figure 9.) This water would be released into the Delta for export primarily in July, August and September. (CCWD 4, pp. 11-12; 20.) Surplus flows from late fall and early winter storms could include substantial amounts of salts from agricultural runoff, especially from San Joaquin River tributaries and from salty flushing flows from Delta agricultural fields. (CCWD 4, pp. 11, 20.) Even if there was no subsequent evaporation on the reservoir islands, this water could have higher salinity levels than the receiving water

in southern Delta channels, which in late summer often carries water of relatively good quality released from Sacramento River reservoirs.

In the winter, many of the agricultural Delta islands release salty water from soil leaching. Terms of the biological opinions prohibit DW from diverting for some days after the onset of the first winter storm (elevated outflow) to avoid harming out-migrating fish. In addition, the biological opinions reduce the DW Project diversion rates. The restrictions in the biological opinions could delay the onset of filling the DW Project reservoirs until water quality improves after a succession of winter storms. The delay in initiation of storage diversions should both move X2 farther west (reducing salinity intrusion) and transport salts from agricultural return flows out of the Delta. Depending on the circumstances of a particular year, the requirements in the biological opinions could result in severe restrictions in Permittee's operations, or even prevent Permittee from diverting water.

One approach to controlling the salinity of water discharged from the DW Project reservoirs is to prohibit diversions of water onto the reservoir islands if the source water has a salinity higher than 180 mg/L total dissolved solids. This limit should keep the salinity of water discharged from the reservoir islands from exceeding 220 mg/L total dissolved solids after evaporation. The long-term total dissolved solids requirement for the State Water Project is 220 mg/L. (CUWA 2, pp. 12-13.) Another approach would be to limit the rate of release of DW Project water so that the receiving water near the discharge point does not exceed 220 mg/L total dissolved solids. These approaches are discussed in more detail below.

6.2.3 Evaporation

Water stored on the reservoir islands for later release would increase in salinity through evaporation, especially during the spring and summer. About 35,000 acre-feet of evaporation would occur on the reservoir islands each year. (R.T. p. 278.) This would concentrate salts in the reservoir water. The FOC contain a topping off provision for June through October that could allow diversion of high quality water onto the islands to dilute the accumulated salts, if water is available during those months. In those months in most years, however, there is no water available for appropriation to storage under the water right priority of DW's applications. (R.T. pp. 277 – 278.)

Stored water might be held on the islands for extended periods. DW assumed that the water usually would be sold and discharged in the late summer after it had been stored the previous winter. The draft EIR/EIS identifies this type of operation as the "worst-case" for determination of environmental impacts. During a succession of wet years, however, or when customers or pumping capacity are unavailable, Permittee might store the water for several years before being able to sell it. Due to evaporation, the salt load of the stored water would increase over time. Winter topping off could dilute the salinity of the stored water.

If Permittee operates the reservoir islands as shallow-water habitat during periods when there are not sufficient surplus flows to fill the reservoir islands, the salt load discharged to the Delta channels could increase. (R.T., pp. 259 – 260; R.T., pp. 2647 – 2650.) Shallow-water habitat operations might continue for several years during a drought. For example, model runs show the islands essentially empty throughout the period 1987 – 1991. (CCWD 3, p. 26.) Unless a nearly continuous exchange of water was maintained, it would be necessary to flush the islands before filling the reservoirs to remove the salt load, and this would add salts to the Delta channels. In the absence of flushing, it would add to the salt load in the stored water. This effect would be reduced if Permittee does not conduct shallow-water habitat operations on the reservoir islands.

6.2.4 Salinity Effects on Water Users

If the DW Project caused only a small increase in salinity in the Delta channels, it might be possible to dilute the releases enough to make the effects on the end user insignificant. At an expected DW release rate averaging about 4,000 cfs for a month, however, and assuming the total exports in late summer will be 8,000 cfs to 12,000 cfs, water released from the DW Project reservoirs could amount to 33 percent to 50 percent or more of the total amount of water exported from the Delta. While some water released from Webb Tract might be tidally mixed and not transported to the export pumps, virtually all water released from Bacon Island would be exported, because the export pumps cause the flows to reverse in Old and Middle rivers when there is low Delta inflow. Most of the water released from the DW Project reservoirs would flow into Clifton Court Forebay. Some could reach the USBR Tracy pumps. The municipalities in the Santa Clara County area, served by the South Bay Aqueduct, would receive the

DW water diluted only by the water in the Delta channels.[21] CCWD also would receive this water directly, because its intakes at Rock Slough and Old River are near the DW discharge points. This effect would continue during the time needed to empty the reservoirs, approximately one to two months if there are no restrictions on the discharge rate to control increases in salinity or DOC in the Delta channels.

DW, CCWD and CUWA have agreed on a set of principles to mitigate potential significant impacts of the DW project operations. While the agreements do not place specific salinity limitations on diverted or released water, the agreements do require that DW not cause impacts beyond certain limits at the urban intakes. Specifically for salinity, the agreements require DW operations to not cause a chloride increase at the urban intakes of more than 10 mg/L, or to cause or contribute to a salinity increase exceeding 90% of an adopted salinity standard. (DW 104, Exhibit A, p. 12.) These criteria are at least as protective as the significance level criteria discussed above, and the 10 mg/L criterion is significantly more protective than the 20% change criterion in the DEIR.

CDWA, in its testimony and exhibits, expressed concern that these salinity criteria would not be sufficiently protective of Delta agriculture. (S-R.T., pp. 519-522.) CDWA expressed two concerns: that some crops need water of better quality than the 0.45 mmhos electrical conductivity objective in the 1995 Bay-Delta Plan, and that DW Project releases could adversely affect salinity in agricultural diversions some distance from the water quality monitoring locations without violating the objectives at the monitoring locations. (S-R.T., pp. 570-571.)

The same restrictions that will prevent significant increases in salinity for municipal diversions are likely to protect agricultural diversions. First, the restrictions on diversion periods, diversion rates, and minimum X2 requirements, combined with the delay in project diversions after surplus flows first arrive in the Delta, all could cause Permittee to divert fresher water than would be the case in the absence of these restrictions. Second, while the SWP and CVP diversion facilities are some distance from the release points of the DW reservoir islands, the two intakes for CCWD (Rock Slough and Old River) are near the release points for the DW Project. The monitoring program and chloride requirements will

[21] If the municipalities have regulating reservoirs in their systems, they could further dilute the salts before treatment.

preclude substantial changes in the receiving water around the release points. Also, in most cases the DW Project water will be released in the late summer or early fall months, when plants are less susceptible to injury from salt. Finally, the FOC require that discharges be restricted from Bacon Island in April through June, and be prohibited from Webb Tract in January through June. (DW 3, p. 9.) These restrictions will greatly reduce impacts of DW project water salinity on Delta agriculture during those periods of the growing season in which plants are most susceptible to damage from salinity.

6.2.5 Potential Net Reductions in Salinity Due to Foregone Agricultural Activities

DW argued that the DW Project could cause a net improvement in salinity in the Delta on an average annual basis because of the cessation of agricultural activities on, as well as return flows from, the project islands.[22] However, foregoing irrigation on the project islands would not usually cause an increase in Delta outflow that would improve water quality, as suggested by DW. (R.T., pp. 306 - 311.) When the Delta is in "balanced conditions", the DWR and USBR release only enough water from upstream reservoirs to maintain the water quality standards. (R.T., pp. 1343-1345.) Any saving in Delta consumptive use would either be exported or saved in upstream reservoirs for later use. In years when water from the DW Project is exported, this reduction in salinity due to foregone agricultural diversions could be counterbalanced by an increase of salinity in the receiving waters (Delta channels) when water is released from the reservoir islands, as discussed above.

6.2.6 Conclusion

The proposed DW project will collect and store water over time, in lieu of continued agricultural operations. It is impossible accurately to predict what the actual salinity of DW Project water will be at its release, given the variables of diverted water quality, storage time (evaporation, subsequent topping off, etc.), and on-island loading. The restrictions on project operations discussed above should ensure that the diverted water is low in salinity, and should reduce the impacts of the released water. These restrictions also provide benefits to fish, and, by extension, provide a measure of protection against significant impacts to Delta agriculture. Therefore, the SWRCB finds that the restrictions on

[22] In a comparison of the model estimates of the salinity of agricultural return flows from Bacon Island with actual measured salinity (CUWA 7a; CCWD 8, Figures 2-6), the measured values were significantly lower than the modeled values. Therefore, the degree of water quality improvement to be expected as a result of foregone agriculture apparently would be less than DW predicts.

project operations discussed above and included in this order, will reduce salinity impacts of the DW Project to a less than significant level.

6.3 Effects of Project Operation on Water Temperature

The DW Project has the potential to adversely affect fisheries by increasing the water temperature in the channels of the Delta when the project discharges water from the reservoir islands. (SWRCB 2, p. 3F-1.) In particular, elevated water temperatures could reduce survival of salmonids, including juvenile chinook salmon and steelhead trout. The SWRCB received conflicting evidence regarding the water temperatures at which adverse effects on salmonids occur.

6.3.1 Water Temperature Requirements of Chinook Salmon and Steelhead

In 1997, DW presented evidence on water temperature effects on chinook salmon, based on review of literature studies. (DW 16, pp. 14-19.) DW testified that water temperatures ranging from 50º - 66º F were physiologically and behaviorally favorable for growth and rearing of non-gravid chinook salmon, but the upper end of the range may be lowered by decreased food availability. (DW 16, p. 36, Table 1.) According to DW, temperatures ranging from 66º - 76º F cause consistent sublethal growth stress, reduced capacity for tolerating large changes in temperature, increased behavioral thermoregulation, increased pathogenicity of many important salmonid disease organisms, and potential for increased vulnerability to predators. (DW 16, p. 36, Table 1.) According to DW, temperatures ranging from 77º - 80º F cause consistent mortality for at least a portion of all tested populations of chinook salmon (particularly juveniles). (DW 16, p. 36, Table 1.)

In 1997, DFG testified that the protective thermal thresholds reported in the scientific literature for each of the salmonid life stages are considerably lower than reported by DW. (R.T., p. 183.) DFG presented evidence that the optimal thermal ranges for chinook salmon and steelhead, based on extensive review of the relevant scientific literature, are as follows. (DFG 7, pp. [A-6] - [A-7]; pp. [A-40] - [A-52], Tables 7-11.)

	Chinook Salmon	Steelhead
Fry Rearing	50º - 54º F	46º - 52º F
Juvenile Rearing	55º - 60º F	46º - 52º F
Smoltification/Emigration	50º - 55º F	44º - 54º F

(DFG 7, p. A-7.)

In 2000, CDWA presented evidence on the water temperature requirements of juvenile chinook salmon and steelhead. (CDWA 26.) CDWA summarized the optimum water temperatures for juvenile chinook salmon reported in the literature. (CDWA 27, pp. 1-2.) CDWA reported that for fish fed maximally in a laboratory, the optimal thermal range for juvenile chinook salmon was between 53º - 62º F, and for fry, the thermal optimum was between 53º - 58º F. (CDWA 26, p. 3.)

The draft EIR/EIS identifies several potential impacts of DW Project operations on fishery resources, including increased channel water temperature resulting from the discharge of water from the reservoir islands. (SWRCB 2, p. 3F-1.) The DEIR/EIS states that channel water temperature exceeding 60º F could significantly reduce chinook salmon survival and may also adversely affect growth. The DEIR/EIS identifies October and April through June as months when juvenile chinook salmon migrate. During these months the temperature of the DW Project discharge is likely to exceed 60º F and may also exceed the water temperature of the receiving channel. (SWRCB 2, p. 3F-16.) The DEIR/EIS states that if water temperature in the Delta channels exceeds 60º F, an increase in channel water temperature greater than 1º F would have a significant adverse impact on juvenile chinook salmon survival. (SWRCB 2, p. 3F-17.) Based on this analysis, the DEIR/EIS proposed that water temperature of the DW discharges be monitored and reduced to avoid any increases in channel water temperature greater than 1º F, in order to reduce water temperature impacts to less than significant levels. (SWRCB 2, p. 3F-17.)

Following the release of the draft EIR/EIS, the USACE, SWRCB, and DW consulted with USFWS, NMFS, and DFG to revise the project to reduce or avoid adverse effects on fishery resources. In January 1997, Final Operations Criteria (FOC) were proposed which were intended to ensure that project operations did not jeopardize the continued existence of delta smelt, Sacramento splittail, winter-run chinook salmon, or steelhead trout. (DW 3; SWRCB 2a, Appendix B.) The FOC include the following water temperature requirements:

- 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 20º F.

- If the natural receiving water temperature of the adjacent channel is greater than or equal to 55º F and less than 66º F, DW discharges for export shall not increase the channel temperature by more than 4º F.

- If the natural receiving water temperature of the adjacent channel is greater than or equal to 66º F and less than 77º F, DW discharges for export shall not cause an increase of more than 2º F.

- If the natural receiving water temperature of the adjacent channel is greater than or equal to 77º F, DW discharges for export shall not cause an increase of more than 1º F.

In May 1997, the USFWS issued a Biological Opinion concerning DW Project effects on delta smelt, and the NMFS issued a Biological Opinion concerning DW Project effects on winter-run chinook salmon and its critical habitat. (DW 1; DW 2.) The opinions require DW to operate the project according to the FOC terms, including terms for water temperature.

In June 1997, DFG issued a Biological Opinion for winter-run chinook salmon that included more stringent temperature requirements than the FOC and the federal biological opinions. (DFG 11.) In August 1998, however, DFG issued a revised CESA Biological Opinion concerning the effects of the project on winter-run chinook salmon, delta smelt, and other terrestrial species. (DW 77.) The opinion requires DW to operate the project according to the FOC terms.

Similarly, in August 2000, the NMFS issued its Final Biological Opinion concerning the effects of the DW Project on spring-run chinook salmon and steelhead, requiring DW to operate the project according to the FOC terms. (DW 80.)

The Revised Draft and Final EIR/EISs (SWRCB 2a; SWRCB 2b.), issued in 2000, find that incorporation of the FOC terms for water temperature reduce the potential temperature-related effects of the project on juvenile chinook salmon to less-than-significant levels.

6.3.2 Conclusions

Based on the evidence discussed above, the SWRCB finds that the water temperature conditions included in the FOC will provide adequate thermal protection for juvenile chinook salmon and steelhead rearing and migrating in the vicinity of the DW Project in the Delta. The FOC, however, identifies temperature criteria only for discharges made "for export". Permittee may discharge water from the project islands for other purposes, such as maintenance of Delta outflow objectives. This decision requires compliance with the temperature criteria during any reservoir discharges to the adjacent channels, regardless of the purpose of the discharge.

To ensure compliance with temperature criteria, Permittee shall prepare a water temperature monitoring plan, in consultation with DFG, NMFS, and USFWS. The plan shall specify the equipment, locations, and frequency of water temperature measurement, and shall specify the method and frequency of reporting. The plan shall be submitted to the Chief, Division of Water Rights, for approval a minimum of 90 days prior to the first release of stored water. If the plan is not adequate for the measurement and reporting of water temperatures, it shall be revised according to the direction of the Chief, Division of Water Rights.

The SWRCB will reserves continuing authority to establish further temperature criteria as needed for the protection of fishery resources, if significant water temperature impacts are identified as a result of project operation.

6.4 Effects of the Project on Dissolved Oxygen Levels

The water quality objective in the Water Quality Control Plan for Basin 5B for fish and wildlife beneficial uses, with respect to dissolved oxygen, is 5.0 mg/L. Additionally, the 1995 Bay-Delta Water Quality Control Plan contains a fish and wildlife objective of 6.0 mg/L during September through November, in the San Joaquin River between Turner Cut and Stockton. Water discharged from the DW Project reservoirs could have low ambient dissolved oxygen levels when released, resulting in

direct reduction in receiving water dissolved oxygen levels. Alternatively, the discharged water could have sufficiently high organic loading that bacterial action in the receiving water might cause a dissolved oxygen sag. Low dissolved oxygen may adversely impact rearing and emigrating juvenile salmonids. Low dissolved oxygen, especially combined with higher summer temperatures, may cause additional physiological stress to adult salmonids. (DFG 8, p. 3.) Migration of adult salmon may also be affected by low dissolved oxygen. (R.T., p. 217.)

The 1995 DEIR noted that fish have negative responses to DO levels below 5 mg/L. The DEIR indicates that any project-caused dissolved oxygen sag exceeding 20% of ambient levels, or causing receiving water dissolved oxygen concentrations to fall below 5 mg/L is a significant impact. (SWRCB 2; p. 3C-23.) The DEIR includes mitigation measures prohibiting discharges that would cause the dissolved oxygen in the receiving waters to decrease more than 1 mg/L. (SWRCB 2, p. 3F-16.) The proposed mitigation includes a monitoring program to track dissolved oxygen levels in discharge and receiving waters, and restricts release rates to prevent dissolved oxygen sags in excess of 1 mg/L. (SWRCB 2, p. 3C-30.)

DW proposed Final Operating Criteria (FOC) for dissolved oxygen. The FOC for dissolved oxygen provides that: (1) no discharge may occur if the water discharged has a dissolved oxygen level of less than 6.0 mg/L; (2) no discharge may occur if the water discharged would depress the adjacent channel water dissolved oxygen level below 5.0 mg/L; and (3) monitoring will be performed to comply with these criteria. (DW 16, pp. 19-20.)

The National Marine Fisheries Service (NMFS) Final Biological Opinion noted that "Salmonids function normally at dissolved oxygen levels of 7.75 mg/L and may exhibit stress symptoms at 6.0 mg/L." (DW 2, p. 19.) The biological opinion noted that the proposed DW criterion may adversely affect rearing and emigrating juveniles if the entire channel cross-section is affected. (DW 2, p. 30.) Nevertheless, the biological opinion adopts the FOC. The USFWS also adopted the FOC in its biological opinion. (DW 1, pp. 19-20.)

The DFG in its 1997 biological opinion determined that the dissolved oxygen criteria in the FOC and adopted by the NMFS did not provide adequate protection for salmonids. The DFG therefore adopted

higher minimum dissolved oxygen criteria for the DW project. The criteria were seasonal, and required minimum July – August dissolved oxygen levels of 6.0 mg/L, and a minimum of 7.0 mg/L the rest of the year. (DFG 11, p. 74.) DFG presented evidence to support these criteria. (DFG 7.) In 1998, the DFG revised its biological opinion, deleting the previous dissolved oxygen requirement and adopting the NMFS and FWS criteria.[23] (DW 77, p. 36.)

In 2000, CDWA presented the same witness and the same evidence that DFG had presented in 1997 on the dissolved oxygen issue, supporting the more restrictive dissolved oxygen criteria originally recommended by DFG. (S-R.T. p. 561; CDWA 26, p. 4.)

As noted above, the 1995 Bay-Delta Water Quality Control Plan includes a 6.0 mg/L dissolved oxygen objective between Turner Cut and Stockton during September through November, for the protection of adult salmon migrating upstream to their spawning areas. (SWRCB 13a, p. 18.) This objective should not be violated by DW releases. It is unlikely that DW releases will have a significant effect on dissolved oxygen levels between Turner Cut and Stockton. An analysis of Delta hydrology under maximum DW releases (assumed to be 6,000 cfs, with 4,000 from Bacon Island and 2,000 from Webb Tract, with maximum SWP and CVP pumping rates), shows that the majority of released water goes to the SWP and CVP export pumps and to the CCWD diversions. (SWRCB 2, pp. [B1-24] - [B-26].) Water flows from the mainstem San Joaquin River through Turner Cut toward Middle River even when there are maximum releases from the DW reservoir islands. (SWRCB 2, Figure B1-48.) This means that little if any water would be carried beyond Turner Cut, even though there may be a small negative (upstream) flow in the San Joaquin River at Stockton. (SWRCB 2, p. [B1-25].) Since the water from Webb Tract will be released near the southeast corner of the island into Old River, little of that water will find its way into the area upstream of Turner Cut, even though tidal excursion may transport some small fraction of the released water into the mainstem San Joaquin River, rather than upstream in Old River toward the export pumps.

[23] DFG prepared the 1998 biological opinion under section 2090 of the Fish and Game Code, which has been repealed. DFG indicated in the 2000 hearing that it planned to issue a take permit for the DW Project under Fish and Game Code section 2081.

The FOC criteria are consistent with, and are more protective than, the Central Valley RWQCB Basin Plan. The minimum of 5 mg/L may help prevent impacts to adult salmon migration. (R.T., p. 217.[24]) However, water released under the proposed criteria has the potential to form a partial or complete barrier to fish movement. Appropriate real-time monitoring will determine whether it will form such a barrier. The criteria should also provide protection for other, non-listed species, which are believed to be less sensitive to low levels of dissolved oxygen in Delta waters. Therefore, the SWRCB will require the same dissolved oxygen criteria as are promulgated in the biological opinions, with the addition of the 6.0 mg/L objective set forth in the 1995 Bay-Delta Water Quality Control Plan. The SWRCB finds that these dissolved oxygen criteria will reduce any impacts in receiving water dissolved oxygen concentrations caused by Delta Wetlands operations to a less than significant level.

7.0 POTENTIAL PHYSICAL IMPACTS OF THE PROJECT

CDWA, PG&E, EBMUD, and CALTRANS raised concerns regarding levee stability, potential damage to and interference with PG&E's gas lines, seepage impacts, EBMUD's aqueducts, and impacts to State Highway 12. DW argued that the protests of CDWA, PG&E, and CALTRANS[25] were matters raising disputes over real property rights and were outside the authority of the SWRCB to resolve. Substantial evidence indicates that the DW Project could cause property damage to the protestants or to their constituents. While DW might be liable to them if such damage occurs, the bases for the protests by these parties are that if the DW Project is likely to harm these parties the DW Project is not in the public interest and should not be approved. The SWRCB has authority to condition water right permits to ensure that a project does not harm the public interest. (Wat. Code § 1253.) Other parties also raised some of the following issues concerning the public interest. Findings set forth in the following paragraphs address the potential harm that could be caused to the public interest by the DW Project.

[24] The witness referred to "water temperatures" but in fact was discussing DO levels in the testimony; units given are in mg/L ["five parts per million"], not in degrees of temperature.

[25] The CALTRANS request is to exclude a 100-foot strip of land from conversion to wetlands on the south side of the highway as it crosses Bouldin Island, which is a proposed habitat island. CALTRANS is seeking to avoid having to mitigate for impacts to a new wetland if and when it widens Highway 12. The modification requested by CALTRANS would reduce the amount of land included within the habitat management plan as mitigation for the effects of reservoir storage on wildlife. It is not be in the public interest to reduce the amount of mitigation for the DW Project in this situation. Accordingly, the SWRCB will not include the restrictions requested by CALTRANS in the permits for the DW Project.

To mitigate for harm to the public interests discussed below, the CDWA in 1997 suggested that the SWRCB require DW to provide funding and financial security to ensure that neighbors of the project who are affected by it can financially deal with problems caused by the project and can ensure that the project is operated to avoid damage on neighboring islands. Damages could occur to PG&E's gas pipeline, EBMUD's water pipelines, railroads, levees, farmland, and other uses of Delta islands.

No statute specifically provides that the SWRCB has authority to require financial assurances in cases where protestants may suffer property damage because of construction or operation of a project the SWRCB approves.[26] (SWRCB Decisions 1587 and 1011.) Nevertheless, the SWRCB has broad public interest authority, and if the SWRCB finds that it is not in the public interest to allow a particular activity unless potential impacts are mitigated, then the SWRCB has authority to condition the permits it issues to provide adequate mitigation. (Wat. Code § 1253.) The SWRCB has previously held that it can deny or restrict a project if the hearing record contains substantial evidence showing that property damage is likely and that it would be contrary to the public interest to authorize the project in light of the damage. (SWRCB Decisions 1523; 1280.) Additional support for this position is provided in the Water Code and in case law. (Wat. Code §§ 1253, 1255, 1256; *Johnson Rancho County Water District* v. *State Water Rights Board* (1965) 235 Cal.App.2d 863 [45 Cal.Rptr. 589].) Accordingly, the SWRCB may, in the public interest, prevent potential damages to neighboring landowners by requiring financial assurances and by requiring design and sign-offs on construction and seepage designs by licensed professional engineers.

The settlement agreement between DW and EBMUD includes financial assurances that will serve the same function as the CDWA recommendation. Attachment B of the settlement agreement includes four classes of financial assurances that will be required, pursuant to the agreement, so long as the DW Project is owned by any entity other than an agency of the state or federal government. (DW 103.) First, the Permittee annually will put money into a Seepage and Monitoring Fund to ensure that it has enough capital resources to operate the seepage control and monitoring systems for the two reservoir islands

[26] CDWA cited a statute that provides for financial assurances to guarantee that mitigation measures will be carried out, but it deals with real property development, not water rights. (*See* Gov. Code § 66499 et seq.) Also, the law cited by CDWA assures the county that mitigation will be done. It does not provide assurances to neighboring property owners whose property might be damaged.

during each full year of operation. The Permittee will draw on the fund over the course of the year, only for the routine expenses of seepage control and monitoring. Second, the Permittee will annually deposit money in a Drawdown Fund to cover the expenses of discharging water from the two DW Project reservoir islands. Third, the Permittee will maintain $1,000,000, adjusted annually for inflation, in a Remedial Actions Fund to pay for the cost of corrective actions in response to complaints of harm to other entities caused by project operations. If it is not used during ten years of reservoir operations, the fund will be cancelled and the monies returned to the Permittee. Each of the above three funds will be held in an escrow account, and Permittee annually will provide an accounting of each fund to a Monitoring and Action Board created under the agreement and to the SWRCB. Fourth, the Permittee will take out and maintain General Liability Insurance in an amount not less than $25,000,000 that provides protection from claims arising from DW Project reservoir islands operations.[27]

Attachment B also establishes the Monitoring and Action Board (MAB) to serve as a neutral technical engineering advisory panel to hear and investigate problems purportedly caused by operation of the DW Project, and to report its recommendations on remedial actions. Permittee would compensate members of the MAB for their time. Attachment B as written would allow the SWRCB to appoint a member to the MAB. Under Attachment B, the parties also have agreed that the SWRCB should include water right permit terms that establish jurisdiction for the SWRCB to revise and enforce the Delta Wetlands Seepage Control Plan set forth in Attachment C of the settlement agreement. The settlement agreement contains adequate measures to ensure that not only EBMUD, but also other landowners in the Delta, have a voice in the design and operation of the project, and an opportunity to comment on project plans. It is not necessary, with these provisions, for the SWRCB to appoint a member to the MAB or regulate the seepage control plan. Further, SWRCB participation on the MAB could imply a bias in favor of MAB decisions when the SWRCB acts in its statutory regulatory role. Accordingly, the SWRCB will not appoint a member to the MAB and will not reserve for itself authority to revise the seepage control plan.

Due to the potential effects of the DW Project on levee stability, seepage, public utilities, and current uses of the Delta, however, the SWRCB will require that the Permittee maintain a general liability

[27] Permittee could unilaterally cancel or materially alter the insurance policy upon thirty days' notice to EBMUD.

insurance policy. Such insurance would be required only if the Permittee is not an agency of the state or federal government, and it would be required for the life of the project and until the DW Project is no longer capable of storing water. Such insurance policy must be in an amount that the insurer deems adequate to pay the maximum reasonable damages that may be caused to owners of property on nearby islands in the Delta or to individuals due to project design, construction, or operation. Such insurance policy shall include a provision under which the insurance company reviews the policy every three years to determine whether the amount of insurance is adequate.

7.1 Seepage

Seepage from the channels onto the islands is a problem throughout the Delta. (SWRCB 2, p. 3D-4.) Because both the islands and the channels separating them are underlain by a more or less continuous aquifer, and because the water level in the channels is at a higher elevation than the surface of the islands, water seeps onto the islands through the levees and upward from the underlying aquifer. To avoid flooding and maintain farmable conditions, farmers collect seepage and pump it back to the channels. (DW 17, pp. 7-8.) When an island becomes flooded, the water filling the interior of the island exerts additional hydraulic pressure on the underlying aquifer, often resulting in increased seepage problems on adjacent islands. The proposed conversion of the Delta Wetlands islands to reservoirs is expected to have a similar effect on neighboring islands. (DW 94, p. 3) Accordingly, agricultural uses and other uses on neighboring islands could be impaired by seepage-induced flooding or moisture damage from DW reservoirs. (CDWA 14.)

A potential exists for construction of the DW Project to exacerbate the seepage effects of the DW Project reservoirs. DW proposes to borrow materials from the floors of the reservoir islands for use in strengthening the levees. The Revised Draft EIR/EIS evaluates the effect of the borrow areas on seepage and concludes that a borrow area 400 feet from the toe of the levee would have little or no effect on the rate of seepage. (SWRCB 2a, App. H, p. [2-15].) Additionally, USACE requirements indicate that the borrow areas should be located at least 800 feet from the levee toe. (SWRCB 2a, App. H, p. [2-15]; DW 94, p. 11.)

A potential also exists for seepage from the channels of the Delta onto the DW islands. The borrow areas are likely to facilitate seepage onto the DW islands by exposing high conductivity zones within the

aquifer. (S-R.T., pp. 530-531; S-R.T., p. 573; SWRCB 2a, App. H, p. [2-16].) Seepage onto the islands could result in the DW Project collecting water to storage from the channels in the Delta either outside Permittee's authorized diversion season or during periods when there is no water available for appropriation under Permittee's water right priority. DW suggested that evapotranspiration losses will far exceed the rate of seepage onto the reservoir islands, but did not support this point with data. (S-R.T., pp. 322-324.)

Seepage impacts to neighboring areas resulting from the DW Project can be controlled by either: (1) installing relief wells beyond the toe of the levees on the neighboring islands, or (2) installing interceptor wells through the levees of the reservoir islands. Because it is not assured of access to neighboring islands, Delta Wetlands proposes to intercept the seepage, before it leaves the reservoir islands, by operating a system of extraction wells constructed through the reservoir island levees into the underlying aquifer.[28] (DW 94, pp. 3-4; R.T., p. 128.)

The seepage mitigation plan proposed by Delta Wetlands can be effective if the interceptor well system is appropriately designed, constructed and operated. (SWRCB 2a, App. H, pp. [2-16]; [4-3].). One of the primary concerns with the proposed seepage interceptor well system is the potential for internal erosion, or piping, which could create cavities under the levees. Such cavities could lead to levee failure. (SWRCB 2a, App. H, p. [3-17].) To reduce the possibility of levee failure, the Revised Draft EIR/EIS recommends careful quality control during installation and development of the interceptor wells. (SWRCB 2a, App. H, pp. [ES-7]; [2-7]; [2-16]; [3-17].)

The success of the proposed seepage mitigation plan will depend on the ability of the Permittee sufficiently to lower the hydraulic head in the aquifer beneath the levees without removing fine-grained material from the levee foundations. The EIR consultant conducted modeling studies for inclusion in the Revised Draft EIR/EIS, evaluating the effectiveness of the proposed interceptor well system. (SWRCB 2a, App. H, pp. [2-10]; [2-14]- [2-15.) Among other factors affecting the system, water in the

[28] DW has suggested installing up to 900 interceptor wells drilled through the reservoir island levees, on about 20 miles of the 26.6 miles of perimeter levees encircling the two reservoir islands. (DW 17, p. 9; DW 62, p. 7.) In a 1991 estimate, DW indicated the interceptor wells would be spaced 160 feet apart, be 50 feet deep, and discharge 70 gallons per minute.

aquifer will flow at a rate proportional to the hydraulic head. (SWRCB 2, p. [3D –3].) The hydraulic conductivity, or rate of flow through the aquifer material, has the greatest influence on overall subsurface flow rates beneath the levees, and consequently on the effectiveness of the proposed interceptor well system. (SWRCB 2a, App. H, pp. [2-11] - [2-15].)

For planning purposes, DW and its consultant estimated the hydraulic conductivity of the aquifer material in part based on particle size analyses, and in part based on laboratory measurements. (SWRCB 2a, App. H, pp. [2-3], [2-6]-[2-7], [2-11]-[2-15], [2-25].) DW's consultant conducted pumping tests at Holland Tract and at the McDonald Island demonstration site. (S-R.T., pp. 312-313; SWRCB 2a, App. H, p. [2-3].) The McDonald Island pumping test site, using temporary wells, showed a much higher value for hydraulic conductivity, but this test found unusually coarse gravels and was not used in evaluating the proposed interceptor well system. (SWRCB 2a, App. H, pp. [2-3], [2-1]-[2-15], [2-25].) DW's consultant did not conduct pumping tests on the aquifer at either of the proposed reservoir islands. (SWRCB 2a, App. H, p. [2-25]; S-R.T., pp. 312-313.)

The aquifer beneath the levees contains significant amounts of fine-grained material that can be removed if wells are not designed appropriately. (S-R.T., p. 310.) The proposed interceptor well system could remove material from the levee foundation. The Revised Draft EIR/EIS concluded that the design, construction, and operation of interceptor wells will be critical to maximize the reliability of the seepage control system and minimize the possibility to flush fine particles out of the levee foundation, which over time could lead to weakened levee foundations and stability problems. (SWRCB 2a, p. [ES-7].) DW indicated it will design the interceptor wells to prevent continued migration of silt from the aquifer. (S-R.T., pp. 313-314.) DW proposes to identify silt zones by examining drill cuttings and conducting electrical logging of the bore holes. (DW 94, p. 12.) However, these methods may not reliably detect silt zones. (S-R.T., pp. 320-321.)

The settlement agreement between DW and EBMUD includes the Delta Wetland Seepage Control Plan, and establishes both a Design Review Board (DRB) for the project and the MAB to review and provide advice regarding the seepage program. The settlement agreement includes a monitoring system to determine both background water levels and seepage. (DW 94, p. 9.) The agreement uses a statistical

approach to develop "significance standards," which, if exceeded, would indicate an increase in seepage due to the operation of the reservoir islands. (DW 17, pp. 13-16.)

The Revised Draft EIR/EIS recommends several modifications to the seepage monitoring system, including installing rows of additional background monitoring wells across adjacent islands, increasing the period of seepage monitoring prior to commencing reservoir operations to three years, and changing the way the significance standards are measured. (SWRCB 2a, App. H, p. [2-19]; SWRCB 2a, App. H, pp. [2-20]-[2-21].) These changes appear unnecessary. (DW 94, pp. 4-10.) Although there could be seepage problems beyond the perimeter levees due to seepage through deeper permeable zones, the agreement requires corrective action if operation of the reservoir islands causes such impacts. (DW 62, p. 5; R.T., pp. 2670-2672.) Changing the significance standards indicating seepage impacts could result in frequent detection of "false positive" values. (DW 94, pp. 7-8.) Also, there would be little additional benefit in increasing the period for collecting background data before commencing reservoir operations (DW 94, pp. 6-7.)

As discussed below in section 7.2, the Division of Safety of Dams (DSOD) of the Department of Water Resources is likely to have regulatory authority over the seepage control system due to its jurisdiction over the design, construction and operation of dams.[29] (Wat. Code §§ 6000 et seq.) The SWRCB will include in its permits for the DW Project a term that requires the Permittee to obtain the approval of all agencies having jurisdiction. Additionally, the SWRCB will require that the Permittee have the project levees and seepage system designed and signed off by a licensed professional engineer qualified in the design of Delta levees and seepage control systems in an estuary. Further, the DW Project levees may be regulated under a permit from the USACE under section 404 of the federal Clean Water Act.

[29] The Department of Water Resources declined to commit itself on the issue of whether and under what circumstances it would regulate the DW Project. If the maximum possible water storage elevation of impounded water within a levee of an island in the Delta does not exceed four feet above mean sea level, it is not considered a dam under Water Code section 6004, subdivision (c). If the reservoir levee is not a dam, DSOD will not regulate it, and consequently will not regulate the seepage control system.

7.2 Levee Stability

Levees in the Delta are used to prevent inundation of the islands and serve to define the channels in the Delta. Many levees are fragile. Today the levees also are necessary to prevent inundation of island interiors during normal runoff and tidal cycles because island interiors have been lowered by extensive soil subsidence. (SWRCB 2, p. 3D-2.) Levees can fail as a consequence of overtopping or levee instability. (*Id*.) Factors contributing to levee instability include seepage, settlement, erosion, subsidence, and seismicity. (SWRCB 2, p. 3D-3.)

Delta levees are highly important, both for flood control and to safeguard the export water supply of the SWP and the CVP. Eight islands--Bethel, Bradford, Holland, Hotchkiss, Jersey, Sherman, Twitchell, and Webb--are considered critical to the protection of water quality in the Delta, and breaching the levees on any of the eight islands would allow salinity intrusion that could affect the quality of water diverted from the southern Delta by the SWP and the CVP. (DWR 25, pp. 40-41.)

During the hearing, several parties, including DWR, CDWA and EBMUD, presented evidence to demonstrate the potential for the DW reservoir levees to fail or be overtopped. The evidence included the effects of weather and seismic conditions, the potential effects of the proposed interceptor wells on structural integrity of the levees, and the methods to be used for levee construction and protection.

Delta Wetlands proposes to widen and raise the existing levees using sand fill material excavated from on-site borrow areas (DW 95, p. 4.) Because this proposed sand fill material is much denser than the relatively weak peat foundation material, the foundation material will consolidate under the load of the new fill material.[30] (SWRCB 2, App. H, pp. [3-6].) Given the existing condition of the levees and the fact that most islands in the Delta have experienced levee failures at one time or another, there is some risk of levee failure whether the project proceeds or not. The proposed levee construction procedures could at least temporarily increase the risk of levee failure. (DW 95, pp. 9-10; SWRCB 2a, p. [6-14]; SWRCB 2a, App. H, pp. [3-7]-[3-9].)

[30] The density of the sand ranges from 110 to 125 pounds per cubic foot; the density for peat is 70 pounds per cubic foot.

Delta Wetlands proposes to conduct detailed investigations prior to initiating construction activities and to construct levee improvements in stages, monitoring stress on the foundation during construction, to ensure that the foundation material is not overstressed during construction. (DW 95, pp. 8-11; S-R.T., pp. 149-152.)

To the extent that other agencies have authority to approve dams and levees for large projects, the SWRCB is not required to conduct a detailed examination of the engineering aspects of the DW Project reservoirs. The SWRCB's regulations do not require the applicant to provide an engineered design in connection with an application to appropriate water. The structural safety of the perimeter and interior levees will be regulated by the DSOD if the maximum possible water storage elevation in the reservoirs is 4 feet above mean sea level or higher. (Wat. Code § 6004(c); SWRCB 2a, p. [6-19].) Levees in the Delta surrounding water impoundments that cannot reach 4 feet above mean sea level are not considered dams, and the DSOD does not regulate them as dams. DW proposes to fill the reservoirs to 6 feet above mean sea level. (R.T., pp. 113-114; DW 62, p. 9.) Additionally, the perimeter levees could require permitting by the Corps under section 404 of the federal Clean Water Act, which requires permits for construction projects that discharge dredged or fill material into the navigable waterways. The SWRCB will require Permittee to obtain all required permits and approvals from other agencies, will require Permittee to maintain liability insurance, and will require that the Permittee have licensed professional construction projects that discharge dredged or fill material into the navigable waterways. The SWRCB will require Permittee to obtain all required permits and approvals from other agencies, will require engineers design and sign off on the DW Project reservoirs, including reservoir construction and the seepage control systems.

7.3 PG&E Lines

PG&E owns two subsurface high-pressure gas transmission pipelines, Lines 57A and 57B, which cross Bacon Island. Line 57B connects PG&E's interstate and intrastate gas transmission and distribution system to the utility's natural gas storage facility under McDonald Island. (SWRCB 2a, p. [7-3]; S-R.T. p. 475; PG&E 6, p. 1.) Line 57A has been capped and removed from operation. However, PG&E may choose to use Line 57A in the future. (DW 96, p. 2; S-R.T. pp. 479, 481-483; SWRCB 2a, p. [7-3].)

Two primary concerns were raised regarding the gas pipelines. First, is it in the public interest to authorize water storage on Bacon Island, considering the presence of the gas pipelines, and if it is in the public interest, what terms and conditions are needed? Second, what is the role of the SWRCB regarding the real property easements for the gas pipelines?

7.3.1 Public Interest Considerations Regarding the Gas Pipelines

DW has not reached an agreement with PG&E on how to ensure that PG&E's natural gas pipelines will be protected and will remain accessible to PG&E at times when the Bacon Island reservoir is storing water. (S-R.T. pp. 484-485.) The SWRCB is required to consider the public interest when deciding whether to approve water right applications. (Wat. Code § 1253.) Line 57B is one of PG&E's main lines for supplying gas to northern California. (S-R.T. p. 576.) If the project is likely to impair PG&E's ability to serve natural gas users, and if it is not in the public interest to impair PG&E's service, the SWRCB can condition the DW Project permits for Bacon Island to prevent adverse effects to the public interest or deny the applications.

The SWRCB received conflicting testimony regarding the impacts of flooding Bacon Island on PG&E's gas lines. PG&E presented evidence to show that the DW Project storage operations could adversely affect PG&E's ability to use its easements, decrease the useful life of the pipelines, require additional pipeline maintenance, increase the threat of pipeline damage, reduce or inhibit pipeline access for routine or emergency repairs, and interrupt gas supply. (SWRCB 2a, p. [7-1]; S-R.T. pp. 475-485; PG&E 6.) DW's expert witness, on the other hand, testified that the inundation of Bacon Island as part of the DW Project will not affect the integrity of the gas lines, including the rate of external corrosion of the pipeline system, because the pipelines are designed to operate in the environment that will exist when the reservoir is in operation. (S-R.T. pp. 169, 171-172, 358-359; DW 96, pp. 1-4, 8.)

PG&E does not have plans, procedures, training, equipment or materials necessary for performing pipeline repairs in a marine environment. (PG&E 6, p. 3.) PG&E's expert witness testified that DW's proposal to flood Bacon Island represents a significant risk to the operation of the PG&E gas storage facility under McDonald Island. He explained that Line 57B is the only gas line currently in operation that connects the McDonald Island storage facility to the PG&E gas transmission system. In his opinion, any failure of this line will result in significant customer impact and curtailment of gas to PG&E customers. (PG&E 6, pp. 3, 6-7; S-R.T. p. 475-476.) PG&E and DW disagree on the impact of the

DW Project on PG&E's ability to make necessary repairs to either pipeline in a flooded condition and the potential for a catastrophic impact on the natural gas supply for Northern California. (*Id.*) Although DW agrees that the conversion of Bacon Island to reservoir storage operations will change the accessibility of the line for the remediation of leaks, DW points out that PG&E manages and operates numerous lines under water in the same conditions that would exist under Bacon Island when it is flooded. For example, Lines 57A and 57B underlie Mildred Island which has been flooded since 1983. There is no evidence in the record that the flooding of Mildred Island has impacted PG&E's operations, but PG&E believes, in the long run, it will have to either reclaim Mildred Island or bore a new gas line underneath Mildred Island. (PG&E 6, pp. 6-8.) PG&E distinguishes the Mildred Island situation from the proposed use of Bacon Island by pointing out that Mildred Island is relatively small compared with Bacon Island and has breaches in its levee that can be used to bring in a barge with repair equipment. (PG&E 6, pp. 6-8; S-R.T. pp. 479-480.) Also, Mildred Island is a static environment, while a Bacon Island reservoir would vary in depth by up to twenty feet, resulting in additional stresses on the pipelines. (S-R.T. pp. 479-480.)

The effort and cost to inspect and possibly repair the gas lines is likely to be greater after the project is constructed than the same repair would be today. In addition, repairing a pipeline leak could entail delays while PG&E secures the services of trained experts who can work in a flooded environment. (PG&E 6, p. 7; S-R.T. pp. 495-498.) DW acknowledges that if Bacon Island is flooded, PG&E will have to change its procedures for Line 57B, making them similar to the procedures it uses on Mildred Island. (DW 96, pp. 5, 7; S-R.T. pp. 170, 360.)

PG&E expressed concern, but presented no data to show, that flooding Bacon Island might accelerate the deterioration of lines 57A and 57B. (PG&E 6, p. 7.) DW's expert concludes, however, that Lines 57A and 57B beneath Bacon and Mildred Islands are in good condition and Line 57B is not degrading by either internal or external corrosion. (DW 96, pp. 1-2, 4; S-R.T. pp. 168, 172.) The DW expert opined that inundation of the gas lines will protect them from external hazards such as agricultural equipment. (S-R.T. pp. 169-173; DW 96, p. 9.)

PG&E's standard policy, when others propose land uses that may impact continued operation and maintenance of existing utility facilities, is to accommodate the new use of their right of way, as long as the other party pays the full cost of relocating the facilities to a new and comparable right of way.

(PG&E 6, pp. 5-6; S-R.T. pp. 477-479.) PG&E takes the position that the DW Project can flood Bacon Island if a study is performed to review and explore various options for mitigating the various impacts that the DW Project would have on PG&E's existing facilities. Regardless of the results of the study, however, PG&E wants the right to decide that the only viable alternative for PG&E is to relocate both pipelines around Bacon Island, or build an additional pipeline across Bacon Island designed for underwater operation. (PG&E 6, pp. 4-5; S-R.T. pp. 477, 484-485.) PG&E is requesting that DW relocate line 57B only. (S-R.T. p. 483.)

The REIR/EIS states that the risk of pipeline rupture will decline under DW Project conditions because the project will substantially reduce ground-disturbing activities by eliminating agricultural activities. However, the DW Project will have the following potential significant impacts on PG&E's pipelines: (1) If not properly weighted, the currently unused Line 57A could float when Bacon Island is inundated, potentially damaging the line; (2) DW's construction of the proposed levees will increase the potential for pipeline rupture; and (3) Flooding the island will potentially interfere with PG&E's pipeline inspection procedures and will inundate the cathodic protection test stations. (SWRCB 2a, pp. [7-7]-[7-10].) In addition, if repairs are needed during flooded conditions on Bacon Island, the cost of the repair operations, the time required for doing repairs, and the duration of service curtailments all could increase. (SWRCB 2a, pp. [7-10]-[7-14].)

DW agrees with the REIR/S proposed mitigation measures, but argues that DW should only have to mitigate for impacts of DW's levee strengthening program that go beyond the impacts of routine levee maintenance by the reclamation district. (DW 96, p. 6.) DW has not, however, provided a detailed design for how the proposed levees will be constructed in the areas of the PG&E pipeline crossings. Further, it would not necessarily be apparent whether levee work is required for maintenance or for reservoir construction. The water right permits to store water on Bacon Island and Webb Tract will be conditioned to ensure proper design and construction of levees, including meeting or exceeding required engineered levee standards.

The following mitigation measures identified in the REIR/EIS will reduce the significant environmental effects of the DW Project on the gas lines to a less than significant level, and are incorporated in the terms and conditions for the permits.

- DW shall ensure that engineering studies, materials, and construction to securely anchor Line 57A is completed before reservoir operations begin on Bacon Island.

- Using appropriate equipment and procedures during and after levee construction and/or strengthening, DW shall have a registered engineer monitor levee settlement and subsidence rates at locations where PG&E's gas pipelines cross Bacon Island levees. DW shall ensure that the pipelines are protected from damage due to settlement, subsidence, and construction equipment. During construction and/or strengthening, monitoring shall be conducted twice daily. After levee completion, DW shall conduct weekly inspections to check for current and potential problems at the gas pipeline crossings, including concerns about levee stability, settlement, and subsidence. If the weekly inspection indicates settlement, erosion, or slumping at the gas pipelines, DW shall notify PG&E and shall implement corrective measures to maintain the required levee stability near the gas lines. Commencing on the date when the water right applications are approved, any levee maintenance and/or improvement activities shall be considered to be levee construction or strengthening for the purpose of this condition.

- DW shall implement measures to minimize the risk of pipeline failure during levee construction and/or strengthening. DW shall be responsible for maintenance associated with installation of new pipeline segments under Bacon Island levees or implementation of other appropriate measures needed to prevent or repair damage to the gas pipeline due to increased bending or shear loads at levee crossings during levee construction and/or strengthening and settlement or damage due to construction equipment.

- DW shall provide access to PG&E to monitor the construction and/or strengthening activities in the areas of the PG&E pipelines.

- DW shall provide adequate facilities on Bacon Island for PG&E's annual pipeline inspection. DW shall provide a suitable ramp and turnaround facilities to launch a

boat for regular pipeline inspections, and should provide a suitable staging area for equipment and materials needed for gas pipeline repairs.

- Pursuant to consultation with PG&E, DW shall relocate the cathodic protection test stations on Bacon Island to the perimeter levee system and shall provide PG&E and the SWRCB access to the relocated cathodic protection test stations. DW shall, before relocating the cathodic protection test stations, prepare a plan for the relocation work and submit it to the Chief, Division of Water Rights for approval, and shall provide a copy to a designated representative of PG&E. DW shall do the work in accordance with the plan as approved.

7.3.2 Access to Bacon Island for Water Storage

A real property access issue exists between DW and PG&E because of easements held by PG&E on Bacon Island. The SWRCB water right proceeding process is not the proper forum to decide whether or not the applicant or the protestant has the right to occupy or use land or other property necessary to the proposed project. (SWRCB Decision 1516.) This limitation is explicitly set forth at California Code of Regulations, title 23, section 777. Accordingly, while the SWRCB has jurisdiction to authorize the diversion of water to storage on Bacon Island, such authorization could not be adequate by itself to authorize DW to flood the parts of Bacon Island where PG&E's gas pipelines are buried. This is a property ownership issue between DW and PG&E that should be resolved between the parties in court if they are not able to resolve it through negotiation. The water right permits authorizing storage of water on Bacon Island will be conditioned to prevent project construction and flooding that may impact PG&E's property rights pending resolution of the dispute. This condition also will protect the public interest in avoiding disruptions of natural gas service.

7.4 Project Benefits

The relative benefit of a project is relevant to determining whether a project is in the public interest. The potential benefits of the project are weighed against the potential negative impacts and, through terms and conditions, the SWRCB balances these benefits and impacts. The settlement agreements[31] between the applicant and some of the protestants, and the biological opinions, provide additional protection for

[31] For a description of all of the settlement agreements, please refer to section 4.3 above.

the public interest. Where applicable, the DW permit terms incorporate the REIR/EIS mitigation measures, settlement agreements, and U.S. Fish and Wildlife Service, National Marine Fisheries Service and California Department of Fish and Game biological opinions. Potential project benefits include the following:

- The CalFed Framework For Action and Record of Decision recognizes a demand for additional water and improved water supply reliability, and includes references to the benefits of in-Delta storage, such as the Delta Wetlands Project. (S-R.T., p. 87.) The April 2000 USBR DW Project Appraisal Report concludes, "The Delta Wetlands Project could provide operational flexibility, unique to in-Delta storage, in meeting CALFED objectives by storing instream flow releases from upstream reservoirs to later meet Delta outflow requirements and enhance water reliability." (DW 82, p. 37.)

- If designed and constructed correctly, the proposed levee improvements on the reservoir islands will improve levee stability. (SWRCB 2A, pp. [6-21]-[6-23], App. H, pp. [4-2] [4-3].) Even if the project were abandoned, the levees would be stronger than they are today. (DW 94, p. 13; DW 95, p. 13; S-R.T., pp. 571-572.) However, the long-term levee maintenance must be continued to retain this benefit. (SWRCB 2A, App. H, p. [3-19].)

- The amounts and types of wetlands and other habitats developed on the habitat islands, in accordance with the Habitat Management Plan, will compensate for the impacts of the project facility construction and water storage operations on the reservoir islands and any impacts associated with construction and operation of the habitat islands. The habitat islands will create new wetlands and habitat areas in the Delta to offset acreage affected by the operation of the DW project. The benefits lost by flooding the reservoir islands will be compensated for by the habitat islands, and the habitat islands will attract new species to the Delta. (SWRCB 2, pp. [2-9] - [2-10], DW 20, 21; R.T., pp. 221-230, 247-249.)

- By converting approximately 20,000 acres of agricultural land to habitat and reservoir land use, there will be significant reductions in fertilizer and pesticide use due to this change in land use. (R.T., pp. 0167-0168.)

8.0 ENVIRONMENTAL AND ENDANGERED SPECIES ACT COMPLIANCE

8.1 General Requirements

Under the California Environmental Quality Act (CEQA) (Pub. Resources Code §§ 21000 et seq.), the SWRCB is the lead agency for preparation of environmental documentation for the DW Project. Under the National Environmental Policy Act (NEPA) (42 U.S.C.A. §§ 4321 to 4370d.), the U.S. Army Corps of Engineers (USACE) is the lead agency. The SWRCB and the USACE jointly prepared the EIR/EIS for the project. As the state lead agency for this project under CEQA, the SWRCB is responsible for preparing a final EIR before it approves the project.

The SWRCB received numerous comments on the adequacy of the 1995 draft EIR/EIS. Additionally, the SWRCB received evidence during the 1997 hearing dates that indicated a need for additional analysis in some subjects. The comments and evidence indicated that some parts of the 1995 draft EIR/EIS failed to identify significant effects of the DW Project. In response to the comments and evidence, the SWRCB and the USACE determined that a revised draft EIR/EIS would be prepared. Pursuant to California Code of Regulations, title 14, section 15088.5, the lead agencies circulated the Revised Draft EIR/EIS for comments on May 31, 2000. Comments were due on July 31, 2000. After the October 2000 hearing dates, the SWRCB directed the consultant to prepare a final EIR. The SWRCB, as the state lead agency, must certify a final environmental document before adopting a decision. (Cal. Code Regs., tit. 14, § 15090.) To help expedite making a decision before two current members of the SWRCB leave office, the SWRCB directed that the final EIR be separated from the EIS for the purpose of creating the final EIR. The final EIR consists of the draft EIR/EIS, the REIR/EIS, the comments, and the responses to comments by the SWRCB.

For the 1995 draft EIR/EIS, the SWRCB and the USACE prepared Biological Assessments under the state and federal Endangered Species Acts and received the following opinions. At the time of the October 2000 hearing dates, these opinions were current.

1. A conference opinion issued by the National Marine Fisheries Service on June 26, 1997, on the then-proposed as endangered Central Valley Evolutionarily Significant Unit (ESU) steelhead trout, finding no jeopardy. It finds that there will be incidental take, and it includes an incidental take statement to authorize take that otherwise would be prohibited under section 9 of the federal Endangered Species Act (ESA) (16 U.S.C.A. § 1538). The conference opinion is now to be treated as a biological opinion, since the Central Valley ESU steelhead trout has been listed as a threatened species under the Act. (63 Fed.Reg. 13347-13371 (March 19, 1998).) The USACE will require compliance with the provisions of the conference opinion in any permit it issues to the DW Project.

2. A biological opinion issued by the National Marine Fisheries Service on May 7, 1997, regarding the endangered Sacramento River winter-run chinook salmon, finding no jeopardy but including an incidental take statement. The USACE will require compliance with the provisions of the biological opinion in any permit it issues to the DW Project.

3. A biological opinion issued by the U.S. Fish and Wildlife Service on May 6, 1997, regarding the threatened Delta smelt, combined with a conference opinion on the proposed as threatened Sacramento splittail. The opinion finds no jeopardy to either the smelt or the splittail, and finds no destruction or adverse modification of critical habitat for the Delta smelt, but it does include an incidental take statement.

4. A biological opinion issued by the DFG on June 16, 1997, under the California Endangered Species Act (CESA) regarding the endangered Sacramento River winter-run chinook salmon, threatened delta smelt, threatened Swainson's hawk, threatened greater sandhill crane, endangered western yellow-billed cuckoo, threatened willow flycatcher, threatened giant garter snake, threatened California black rail, endangered bald eagle, endangered riparian brush rabbit, and endangered American peregrine falcon. The opinion also addresses the following special status species: splittail, spring-run chinook salmon, longfin smelt, Sacramento perch, green

> sturgeon, northwestern pond turtle, southwestern pond turtle, Aleutian Canada goose, tricolored blackbird, loggerhead shrike, burrowing owl, riparian woodrat, rose mallow, Delta tule pea, Suisun aster, and Mason's lilaeopsis. The opinion finds no jeopardy, but finds that there will be incidental take of listed species, and therefore includes reasonable and prudent measures to minimize the impacts of incidental taking of listed species. At the hearing on October 10, 2000, DFG's attorney stated that the biological opinion will be rewritten as an incidental take permit under Fish and Game Code section 2081. DFG requested that the SWRCB include a permit term in any permit it issues for the DW Project, requiring that the DW Project comply with the terms of any incidental take permit issued by DFG, and that a violation of the incidental take permit will be a violation of the water right permit. A term satisfying DFG's request will be included in each permit issued for the DW Project.

CEQA establishes a duty for public agencies to avoid or minimize environmental damage if feasible. (Cal. Code Regs., tit. 14, § 15092.) If a final EIR identifies one or more significant environmental impacts of a project, a public agency must make written findings for each significant impact and must explain each finding. (Cal. Code Regs., tit. 14, § 15091.) In deciding whether and how to approve the project, the SWRCB must consider the environmental effects of the project as disclosed in the final EIR. The SWRCB is responsible for mitigating or avoiding only the significant environmental effects of the parts of the project it decides to approve. The SWRCB must make findings of overriding considerations for significant effects within its responsibility that it cannot avoid or mitigate. (Cal. Code Regs., tit. 14, § 15093.)

Public Resources Code section 21081.6(a) requires that if a public agency makes changes or alterations in a project to mitigate or avoid the significant adverse environmental effects of the project, it must adopt a monitoring or reporting program to ensure compliance with the changes or alterations. This decision contains terms and conditions to implement a mitigation and monitoring plan for identified significant environmental effects that are within the SWRCB's responsibility. This decision also indicates which mitigation measures are not within the SWRCB's authority to implement. Finally, this

decision identifies significant effects on the environment that are unavoidable but are acceptable due to overriding considerations.

8.2 Significant Effects on Wildlife, Listed Terrestrial Species, and Wetlands Resources

The Delta is a rich mixture of sloughs, wetlands and agricultural lands that support diverse wildlife populations. It is generally noted as an important area in the Pacific Flyway for wintering waterfowl, but it is also important habitat for many species of reptiles, non-waterfowl birds (resident and seasonal migrants) and a diverse mammal fauna. (SWRCB 2, Appendix H-1, Table H1-1.)

DW proposes to divert and store water on two islands, Bacon Island and Webb Tract, in the Delta. The DW Project would dedicate two additional islands, Bouldin Island and Holland Tract, primarily to management for wetland and wildlife habitat values to offset biological impacts resulting from the water storage operations on Bacon Island and Webb Tract. The reservoir islands include approximately 11,000 acres of agricultural land, while the wetland and wildlife management lands or habitat islands include approximately 9,000 acres of primarily agricultural land. (SWRCB 2, App. G3, pp. 1.)

Construction of project facilities and levee improvements on sites occupied by special-status plants could result in the loss of such plants, and would be a significant impact. The DW Project also would cause significant impacts through losses of riparian and permanent pond habitats and of upland and agricultural habitats on the reservoir islands. Additionally, the DW Project would cause significant impacts by changing the existing, primarily agricultural, vegetation conditions on the project islands; the reservoir islands' vegetation would change to open water, mudflat, herbaceous, and shallow water wetland, while the habitat islands' vegetation would change to crops and upland, wetland, woodland, and scrub.

Mitigation: The primary mitigation for the effects of the DW Project on the reservoir islands is the dedication and management of the habitat islands primarily for wetland and wildlife values. The islands would be developed into a mosaic of habitat types for a variety of wildlife benefits, with an emphasis on offsetting project impacts on state-listed wildlife species.

The habitat islands would be managed primarily to offset impacts of water storage operations on:

- state-listed threatened species (Swainson's hawk and greater sandhill crane),

- jurisdictional waters of the United States (jurisdictional wetlands) pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899; and

- wintering waterfowl habitat.

In addition, habitat islands would also be managed to provide breeding and foraging habitat for other wildlife species. Recreational activities that are compatible with the above primary management objectives, including upland game and waterfowl hunting and wildlife viewing, also would be permitted. (SWRCB 2, App. G3 p. 1.)

The management of the habitat islands is set forth in a Habitat Management Plan (HMP), which when implemented will fully compensate for the impacts of the DW Project reservoirs on listed wildlife and on wetlands. (SWRCB 2, App. G3.) The HMP is a stand-alone management document that describes how the habitat islands will be physically managed to offset project impacts to state-listed threatened species, wintering waterfowl, and jurisdictional wetlands. Land management practices to benefit other wildlife species were also incorporated into the plan. The HMP specifically describes:

- goals and objectives for wildlife habitat management,
- goals and objectives for jurisdictional wetlands mitigation and management,
- design and functions of habitats,
- management guidelines for habitat and recreation,
- island infrastructure and levee maintenance,
- procedures for ensuring the short- and long-term success of project compensation, and
- a designated management team the “Habitat Management Advisory Committee” (HMAC), and
- monitoring programs and an adaptive management process for addressing changes in island habitat management. (SWRCB 2, Appendix G3; DW 20, p. 6.)

DW presented evidence regarding the development and goals of the HMP to the effect that the implementation of the HMP would fully compensated for potential significant impacts of the water storage operations on wildlife that inhabit or are likely to inhabit the Delta Wetlands Project. (DW 20, pp. 4-8, 23.) The DW Project will result in considerably greater benefits for wildlife than currently exist on the four islands. Further, the HMP will provide benefits to all species listed as threatened and endangered under the California Endangered Species Act. The HMP uses a conservative approach in addressing the project's impacts, which should assure success. (DW 21, p. 2.) The managed habitats and enhanced agricultural habitats of the HMP will support a greater abundance and diversity of wildlife species than do the more simple agricultural systems. (DW 21, pp. 3.) The HMP is intended to present the "best estimate" starting point for habitat management on the habitat islands. It uses a modern "adaptive resource management" approach, which will allow for future modifications of habitats based on the results of on-going monitoring and review by the HMAC. (DW 21, p. 10.) The HMP presents a comprehensive design and strategy for future management and that the benefits will far exceed required mitigation for the Delta Wetlands Project. (DW 21, p. 4.) All of the biological opinions require that the HMP mitigation measures be included in the project approvals.

This decision requires the implementation of the HMP and the mitigation measures in the final EIR listed as mitigation measures H-1 through H-3 and G-1 through G-3. With these mitigation measures, each of the potential impacts of the DW Project to the wildlife resources and habitat will be offset, reduced to less than significant, or become beneficial, each of the potential impacts to special status plants and habitats will be mitigated to a less than significant level, or will be beneficial.

8.3 Significant Effects on Fisheries

8.3.1 General Project Impacts and Benefits

The Delta Wetlands Project has the potential to significantly impact numerous fish species in the Delta, including species listed under the state and federal Endangered Species Acts (Fish & G. Code, § 2050 et seq.; 16 U.S.C.A. §§ 1531-1544) and non-listed species. Construction and operation of the project could impact fish directly, and also affect fish habitat. Direct effects include the following impacts: entrainment of eggs, larvae and young fish into the diversion structures, or into other Delta diversion and export pump intakes, reduced Delta outflow, changing water flow patterns which could contribute to straying or delays in migration, and changes in receiving water temperature, salinity,

turbidity, dissolved oxygen, or contaminant levels. (DW 77, p. 9.) Indirect effects primarily involve impacts to aquatic habitat, including spawning and rearing habitat. (DW 1, p. 24.)

Because listed species have the potential to be impacted to a proportionately greater degree than other species, discussion of impacts and ways to mitigate for those impacts have been concentrated on those species. (DW 1; DW 2; DW 3; DW 77.) However, the EIR also examines effects on non-listed species, such as striped bass, American shad and invertebrate species. (SWRCB 2, pp. [3F-5] – [3F-9].) Mitigation measures have been directed primarily to reducing impacts on listed species; however, the proposed mitigation measures will also reduce impacts to non-listed species. (SWRCB 2a, p. 5-3.)

Some project operations may also be beneficial to fish. For example, water released from the islands may contain food items (prey) for winter-run chinook salmon. (DW 2, p. 26.) Additionally, a large number of unscreened siphons presently used to divert water onto the project islands will be removed or screened. (R.T., pp. 196-197.)

Some of the impacts listed above are related to water quality, even though the impacts and mitigation measures are directed to fish impacts. These topics are discussed above in the water quality section; specifically, turbidity (Section 6.1), salinity (Section 6.2), temperature (Section 6.3, and dissolved oxygen (Section 6.4). These discussions will not be repeated here. The remaining impacts, and their mitigation measures, are discussed in more detail below. Note also that Permittee will be required to undertake an extensive fish monitoring program, the results of which will be used to modify project operations in various ways to further reduce overall fishery impacts. (DW 77, pp. 47-48.)

The DW project, as proposed, could have significant impacts on fishery resources. Many of the mitigation measures are included in the biological opinions of the USFWS, NMFS and DFG. (DW 1; DW 2; DW 77; DW 78; DW 79; DW 80.) These measures are required in this decision by reference to the biological opinions. The Board finds that implementation of the measures will reduce the fishery impacts related to the construction and operation of the DW Project to less than significant levels.

8.3.2 Entrainment

The Delta Wetlands Project will represent a major new diversion of water from Delta channels into storage, and release of the water for export may result in an incremental increase in diversions to the SWP and CVP export facilities. As proposed, the DW Project would have the capacity to store up to 238,000 acre-feet on the two reservoir islands (SWRCB 2, p. 2-4), with a maximum diversion rate of up to 9,000 cubic feet per second (cfs) through sets of large siphons. (SWRCB 2, p. 3B-15.) Even at lower monthly average rates of 4,000 cfs (SWRCB 2, p. 3B-15), the siphons will be able to entrain large numbers of fish, especially eggs, larvae and small juvenile fish. Associated with entrainment losses are other direct losses due to predation, impingement and abrasion. (DW 77, p. 15.)

Mitigation: Several proposed mitigation measures will reduce entrainment losses. The most effective mitigation measure is to curtail or eliminate diversions during certain periods critical to fish. The FOC and the biological opinions contain an extensive list of specific restrictions on diversions. (See, for example, DW–1, pp. 11-15.) This decision places additional restrictions on DW Project discharge operations to reduce entrainment losses at the export pumps. (See DW 1, pp. 16-17.)

A second measure is screening. DW diversion siphons will be required to be screened, and to operate so that the maximum approach velocity near the screens is no more than 0.2 foot per second. This low velocity will reduce entrainment and impingement of eggs and small fish. (DW 1, p. 18.)

Even with the diversion and release restrictions and the fish screens, some incidental take will occur. The Permittee will mitigate this impact by paying DFG $1.00 per acre-foot diverted during specified periods of the year. This payment will be used by DFG in various ways to mitigate for delta smelt losses. (DW 77, p. 55.)

In its protest dismissal agreement with EBMUD, DW has agreed to limit the number of siphons on Bouldin Island and Webb Tract, and to modify its diversion operations on Webb Tract. (EBMUD 6, pp. [A-1]-[A-2].) These and related actions discussed below should reduce impacts on Mokelumne River salmon.

8.3.3 Reduced Delta Outflow

Diversions of Delta inflow by the DW Project will cause a proportionate reduction in Delta outflow. Such reductions can result in salinity intrusion, and delay in transport of eggs, larvae and juveniles through and out of the Delta.

Mitigation: These impacts will be mitigated in two ways. First, to reduce salinity intrusion, the DW Project will be restricted in its diversion operations to those periods when X2 is downstream of specified locations. (DW 3, p. 3.) Second, to reduce delays in transport of fish eggs, larvae, and juveniles, DW Project diversions will be restricted to specific percentages of Delta outflow, available surplus flow, or San Joaquin River inflow. (DW 3, pp. 4-6.) These measures will assure that flows necessary for transport are available in the Delta.

Additionally, the FOC also provide for an "environmental water" set-aside to provide additional water for Delta outflow. (DW 3, pp. 9-10.)

8.3.4 Changes in Delta Flow Patterns

In addition to reductions in Delta outflow, DW Project diversions and releases will affect in-Delta flow patterns. These changes can affect fish transport, as discussed above, and can have an effect on migration paths and orientation.

Mitigation: The following mitigation measures will reduce the significant environmental effects of the DW Project on flow patterns to a less than significant level. First, the prohibition in the biological opinions on diversions during April and May mitigate for potential impacts to fall-run salmon smolts. Potential impacts to fall-run salmon fry from the Mokelumne River, disruption of adult migration, and potential losses due to predation around boat piers and other structures are mitigated in an agreement between DW and EBMUD. (EBMUD 3, pp. 2-4; EBMUD 3, pp. 4-5; EBMUD 6.)

The DFG biological opinion adds restrictions on DW Project diversions beyond the restrictions set out in the FOC, and will further reduce impacts to Delta flow patterns. (DW 77, p. 58).

Also, Permittee and DFG will establish an Environmental Water Fund that may be used to purchase environmental water. (DW 77, pp. 43-45.)

8.3.5 Contaminant Loading

The DEIR/EIS identified potential contaminants on the DW Project Islands, which could impact water quality. These include residues from pesticides applied by agricultural operations, materials from waste disposal sites, and residues at maintenance and repair facilities for agricultural equipment. (SWRCB 2, pp. [3C-11]-[3C-13].) Although some preliminary investigations have been conducted on the four islands, the DEIR/EIS stated that the water storage on the reservoir islands could mobilize soil contaminants at historical pollution sites, which could cause significant impacts to water quality. These materials could affect fish health in various ways.

Mitigation: The following mitigation measures, which are required in this decision, will reduce the significant environmental effects of the DW Project on water quality to a less than significant level. First, this decision requires that Permittee conduct additional preliminary site assessments at potential contamination sites. (SWRCB 2, p. [3C-31].) Second, this decision requires that Permittee not use onsite soils for levee construction until the Regional Board determines that the soils do not pose a threat to water quality.

8.3.6 Changes in Aquatic Habitat

In addition to direct impacts to fish and invertebrates, the DW Project may have impacts on aquatic habitat in the Delta. These impacts may take several forms: construction impacts, levee and habitat erosion from boat wakes due to increased boat traffic associated with project facilities, and potential impacts to freshwater habitat resulting from reduced Delta outflow.

Mitigation: The following measures that are required by other agencies and are incorporated into the proposed project will reduce the impacts on changes in aquatic habitat to a less than significant level.

Construction in channels or affecting tidal aquatic water habitat will be limited to the period between June and November. (DW 3, p. 16.) Construction personnel will be required to receive an orientation

on listed species, provide notification on listed species, and provide construction compliance reports. (DW 77, pp. 54-55.)

DW has agreed to limit the number of boat slips for its recreational facilities. (SWRCB 2b, p. [2-15].) DW has agreed to additional restrictions on boats in specific areas adjacent to Mokelumne River migration routes. (EBMUD 6, p. A-2.) The FOC provide for a payment of $100/year/berth for each net additional boat berth built; the funds will be used to mitigate for boat wake erosion. (DW 3, p. 12.)

Impacts to aquatic habitat will be mitigated by replacement of actual habitat losses at a 3:1 ratio, and an additional 200 acres of habitat will be set aside in perpetuity to mitigate for general losses habitat associated with the DW project. (DW 3, p. 12.) In addition, the NMFS biological opinion for spring-run salmon includes requirements for preservation and regeneration of riparian vegetation and shaded riverine aquatic habitat on the levees of the project islands. These measures will also provide benefits for other species which use these habitats. (DW 80, App. 3.)

8.4 Other Environmental Impacts

The DW Project will have significant environmental effects on a variety of resources. These impacts are described in the DEIR (SWRCB 2), and some are discussed more fully in the REIR. (SWRCB 2a.) While many of these impacts can be mitigated to a less than significant level, other cannot, and remain significant and unmitigable. The significant impacts, and available mitigation measures, are described below. Where required, a statement of overriding considerations is provided.

8.4.1 Hydrodynamics

The DEIR identified no direct significant effects of project operations on hydrodynamics. However, The DEIR identified a potentially significant cumulative effect of the operation of the DW Project combined with utilization of the full pumping capacity (10,300 cfs) at the SWP pumping plant in the southern Delta. Flows in Delta channels could exceed the historical flow rates. Flow rates in south Delta channels are determined by the pumping and/or diversion rates at the SWP and CVP facilities, regardless of the source of the water being diverted. Therefore, releases from DW reservoir islands cannot cause higher channel flows than would otherwise occur in the absence of those releases, assuming that other water was available for export. However, the availability of the water may mean

that the export facilities may operate for a longer duration than they otherwise would, which could result in a higher cumulative effect on scouring or other flow related process.

Mitigation: A term is included in this decision to reduce impacts to a less than significant level by restricting discharges when the discharges cause adverse effects.

8.4.2 Water Quality

The DEIR presented numerous significant environmental impacts, related to salinity, TOC, THM's, and loading of pesticides from the reservoir islands. These impacts included both project-specific and cumulative impacts. The project impacts are discussed in Sections 6.1, 6.4 and 8.3.5.

Mitigation: All cumulative impacts except one are covered by the same mitigation measures proposed for direct project impacts. The only additional impact is the cumulative increase in pollutant loading in Delta channels due to the incremental increase in boating activities. Mitigation measure C-9 (SWRCB 2, pp. [3C-36] – [3C-37]) will reduce the impact, but not to a less than significant level. Contra Costa County and San Joaquin County have responsibility and jurisdiction over the boating and recreational aspects of the project. DW has agreed to reduce its total number of recreational boat slips for the project by 50%, but this reduction still does not reduce the impact to a less than significant level. (SWRCB 2b, pp. [2-15] – [2-19]; [2-21].) The responsible agencies, if they approve the facilities, can and should impose additional measures to reduce this impact to a less than significant level, or make findings of overriding consideration for this impact.

8.4.3 Flood Control

The impacts of the DW Project on flood control are discussed in sections 7.1 and 7.2, above.

Mitigation: Mitigation of these impacts is within the responsibility and jurisdiction of the Division of Safety of Dams of the DWR. The mitigation measures discussed in the EIR can and should be adopted by the Division of Safety of Dams if it approves the DW Project facilities.

8.4.4 Impacts to Utilities and Highways

This section addresses a series of related public service-type impacts, including highways, roads, ferry service, gas facilities, electrical facilities, police and fire protection services, water supply, sewage disposal, solid waste disposal, railroad lines, and aqueducts. The gas facilities are discussed in Section 7.3. Highway impacts are discussed in Section 7. Impacts to railroads and aqueducts, primarily due to levee failure, are discussed in Section 7.2.

The EIR identifies no significant impacts to county roads or ferry service due to the project. The EIR identifies significant impacts to electrical facilities and service. It also identifies significant impacts to fire and police protection, water supply, sewage and waste disposal.

Mitigation: The significant impacts to electrical facilities and service will be reduced to less than significant with mitigation terms included in this decision to require relocation of transmission lines and increase electrical capacity. Permittee will be responsible for funding these activities and conducting appropriate environmental surveys for sensitive or listed species. Impacts relating to fire and police protection, water supply, sewage and waste disposal can be mitigated by requirements to incorporate certain safety design features in buildings, and are within the responsibility and jurisdiction of Contra Costa County and San Joaquin County. These counties can and should adopt these mitigation measures. Highway 12 would be significantly impacted only under Alternative 3, which is not under consideration here. No significant cumulative impacts over and above those determined for the project-specific impacts were identified in the EIR.

8.4.5 Fishery Resources

Numerous fishery resource impacts were identified in the DEIR, and some additional information was provided in the REIR. These impacts and mitigation measures are discussed in Section 8.3. All impacts to fishery resources have been reduced to a less than significant level for both listed and non-listed species. Significant cumulative impacts are reduced to less than significant levels by implementation of the project-specific mitigation measures.

8.4.6 Land Use and Agriculture

The DW Project will cause the total loss of approximately 5,403 acres of farmland on Bacon Island and 5,149 acres on Webb Tract. (SWRCB 2, Table 3I-4.) Although some agriculture will continue on the habitat islands,[32] it would be directed primarily to wildlife management, not crop production. Although the reservoir islands could in theory be returned to agricultural production if the project is abandoned, the borrow pits dug for levee construction material might render this alternative practically impossible. Loss of these Class III agricultural lands is significant and unmitigable. (SWRCB 2, p. [3I-17].) Maintaining agriculture on these islands for crop production is not compatible with the DW Project. The value of the DW Project for water supply outweighs and overrides the importance of maintaining agriculture on the DW Project islands and makes this impact acceptable.

8.4.7 Recreational and Visual Resources

The recreational features of the DW Project will enhance recreational activities such as hunting and boating. These activities have impacts, primarily on the boating experience in the Delta (speed restrictions, increased number of boats, etc.) Increased traffic and air quality problems are associated with these activities. Also, the siphons, pumps, and recreational buildings, removal of vegetation, and other project activities will impact the visual environment of the Delta.

The negative changes to the Delta boating experience will be significant and cannot be mitigated to a less than significant level, even with DW's agreement to reduce the number of recreational boats slips by 50%. (SWRCB 2b, Table 2-1.) One of the visual impacts can be mitigated to a less than significant level. (SWRCB 2, p. [3J-21].) The second visual impact, to the view from adjacent waterways and the Amtrak railway line, cannot be mitigated to a level of insignificance although mitigation measures J-1, J-2 and J-3 in the EIR are required by this decision. This impact is a result of the siphons, pumps, and other diversion facilities, and is unavoidable. This visual impact is necessary to implementation of the

[32] The habitat islands will be dedicated in perpetuity to habitat use regardless of the future use of the reservoir islands. The DEIR incorrectly states that the conversion of agricultural lands to the proposed uses on Webb Tract and Holland Tract is inconsistent with the Contra Costa County General Plan Agricultural Principles, and that this impact is significant and unmitigable. (SWRCB 2, p. [3I-18].) These lands are nearly all Class III and IV, however, and therefore are not included in the Contra Costa County General Plan Agricultural Principles, which apply only to Class I and II lands. (SWRCB 2b, p. [3.C-100.] Therefore, the Final EIR now states that this impact is less than significant. (SWRCB 2b, p. [3.C-109] – [3.C-110].)

DW Project. The value of the project for water supply overrides the visual impact and makes it acceptable. Permitting of the recreational facilities for the DW Project, which also will cause a visual impact, is within the responsibility and jurisdiction of Contra Costa County and San Joaquin County. These counties can and should adopt the mitigation measures in the EIR, and if they approve the project, should make a finding of overriding considerations for the unmitigated visual impact.

8.4.8 Economic Conditions and Effects

Economic effects are not considered environmental effects under CEQA although economic impacts can lead to environmental effects. The DEIR provides information on the economic effects of the proposed project. There are no identified indirect environmental effects, and no mitigation measures are required.

8.4.9 Traffic

The DW Project will increase highway and boating traffic. (SWRCB 2, pp. [3L-11]-[3L-12]; [3L-18]-[3L-21].) These impacts are due primarily to recreational facilities associated with the project, although some are due to project construction. These impacts are significant and largely unmitigable.

The impacts to traffic safety of project construction can be mitigated to a less than significant level. This decision requires implementation of mitigation measures L-1, L-2 and L-3.

The impacts to traffic due to the recreational facilities are within the responsibility and jurisdiction of Contra Costa County and San Joaquin County. These counties can and should adopt the mitigation measures in the EIR, and if they approve the project, should make a finding of overriding considerations for the unmitigated traffic impacts.

8.4.10 Cultural Resources

The majority of the cultural resource studies have been completed in compliance with section 106 of the National Historic Preservation Act (NHPA) of 1966 (amended in 1992) as required pursuant to both NEPA and CEQA. Under California Code of Regulations, Title 14, section 15064.5, a public agency following the federal clearance process under the NHPA may use the documentation prepared under the federal guidelines to satisfy CEQA requirements. The federal regulations provide an alternate mechanism by which the USACE can conclude the section 106 process by the use of a Programmatic

Agreement (PA). The completion of the NHPA, section 106 process, implementation of its terms, and compliance with the PA satisfies the CEQA requirements for addressing cultural resources that are "historically significant." The PA defines the agency roles and responsibilities, and specifies how and when mitigation will occur. Execution of this agreement and implementation of its terms evidences that the appropriate agencies have afforded the Advisory Council on Historic Preservation a reasonable opportunity to comment on the management of historic properties affected by the project, and that the effects of the project on such properties have been taken into account in compliance with section 106 of the NHPA.

Implementation of the DW Project has the potential to result in several significant impacts to historic properties, which includes prehistoric, historic and architectural properties. These impacts include demolition of the historic district on Bacon Island, and the disturbance of prehistoric buried resources that may be present on Webb Tract, the archeological site on Bouldin Island that may be eligible for National Register of Historic Places (NRHP) listing, and intact burials and buried prehistoric resources possibly present on Holland Tract. Although measures to document and preserve information about the resources have been recommended to reduce the impact on the NRHP-eligible district on Bacon Island, this impact would remain significant and unavoidable. Impacts on Webb Tract prehistoric resources and Bouldin Island historic–period resources can be reduced to a less than significant level through preparation of an Historic Properties Management Plan (HPMP), providing treatment and monitoring of these resources, and preparation of a data recovery plan for resources on Bouldin Island. Disturbance of intact burials and buried resources on Holland Tract under the proposed project will be avoided with the design of habitat management and enhancement activities to prevent such disturbance and the preparation of an HPMP.

Implementation of the DW Project alternatives would also result in cumulative impacts on historic-period resources. Destruction of the historic agricultural labor camps on Bacon Island, that may be eligible for NRHP listing as a rural historic district, would add to the loss of this historic resource type in the Delta. This impact is considered significant and unavoidable. Preservation of the Bacon Island historic resources is not compatible with project construction and operation. The value of the DW Project as a water supply project overrides this unavoidable environmental effect and makes it acceptable.

Effects of the DW Project would not significantly contribute to the overall loss of prehistoric resources in the Delta and are considered less than significant with the appropriate mitigation measures as discussed in the PA. Mitigation measures will be further refined resultant from the investigations enumerated in the PA.

8.4.11 Mosquitoes and Public Health

Both the reservoirs and the habitat islands may increase mosquito populations in the Delta. The DEIR/EIS identifies this as a significant effect. Mosquitoes serve as vectors for malaria and several forms of encephalitis. (SWRCB 2, p. [3N-4].) Cooperation with the county mosquito abatement districts in the counties of San Joaquin and Contra Costa will reduce this impact to less than significant. Mosquito control is within the responsibility and jurisdiction of these districts, which can and should adopt the mitigation measures in the EIR. This decision requires Permittee to obtain all required approvals from local, state, and federal agencies and requires implementation of mitigation measure N-1 in the EIR.

The DEIR/EIS also finds that, due to restoring the DW Project wetlands, other wetlands, and increased housing in the Delta, there will be a cumulative increase in mosquito abatement activities and their effects. No mitigation measures are available to reduce these impacts to insignificance. The value of the DW Project as a water supply project overrides this unavoidable environmental effect and makes it acceptable.

8.4.12 Air Quality

Construction and operation of the DW Project will have significant impacts on air quality. Increases in ozone precursors, oxides of nitrogen, and PM10 particles due to project construction and operation will all have significant impacts on air quality. The DEIR includes several mitigation measures, but these will not reduce the impacts to insignificance. (SWRCB 2b, Table 2-1.) This decision requires implementation of mitigation measures O-1, O-2, O-3, and O-4 in the EIR. The value of the DW Project as a water supply project overrides these unavoidable environmental effects and makes them acceptable.

9.0 PROJECT FEASIBILITY

The SWRCB is required to condition any permit it issues to best develop, conserve, and utilize in the public interest the water to be appropriated. (Wat. Code § 1253.) If the SWRCB finds that a proposed appropriation will not best conserve the public interest, it is required to reject the application. (Wat. Code § 1255.) Numerous factors are relevant to a determination of public interest. In the hearing on the DW Project, public interest concerns raised by the parties included water quality impacts on domestic water supplies, water marketability, financial feasibility of the project, feasibility of proposed levee construction activities, mitigation of seepage impacts on neighboring islands, potential damage to neighboring property, and impacts on fish and wildlife.

The following findings address feasibility of the project. Feasibility of the project is a consideration in deciding whether it would be in the public interest to approve a project. The SWRCB has broad discretion to decide whether a proposed project would best conserve the public interest. (*Bank of America N.T. & S.A.* v. *SWRCB* (1974) 42 Cal.App.3d 198 [116 Cal.Rptr. 770]; *Johnson Rancho County Water District* v. *State Water Rights Board* (1965) 235 Cal.App.2d 863 [45 Cal.Rptr. 589].)

In 1997, DW presented testimony indicating that its lender would consider the project economically feasible if it can yield an average of 154,000 acre-feet of water per year. (R.T. pp. 2333-2335.) In 2000, however, DW presented evidence that a minimum yield of 154,000 acre-feet was not necessary for the project to be economically feasible, because water provided by DW may provide benefits to programs such as CALFED due to timing and location benefits. Under current circumstances, the applicant claims that the DW Project will be economically feasible if DW Project water can be sold within the price range of other competitive sources. The price of water may range from $265 to $700 an acre-foot. (S-R.T., p. 183; DW 98, p. 1.) Without an identified buyer, however, the minimum yield for the project would be uncertain. (DW 99, p. 2.) Also, without a long-term buyer, it may not be possible to sell water during wet years because of lower demand and consequently lower prices for alternative water supplies. Further, the results of future studies necessary for a final levee and seepage control system design may make the project economically infeasible. Accordingly, the SWRCB will require the Permittee to identify a buyer or buyers for the project water before filling the reservoirs. This condition is necessary to ensure that the project does not proceed until it is shown to be economically feasible.

The USBR's April 2000 "Delta Wetlands Appraisal Report" concludes that the project is potentially feasible as a federally owned and operated project. However, the USBR intends to do a more detailed feasibility investigation to resolve the remaining concerns and uncertainties. (DW 82, p. 38.)

This decision includes terms and conditions, discussed in Sections 7.1 and 7.2, to ensure that the project is technically feasible. The water right permits for the DW Project will require that all design and construction activities comply with DSOD requirements. DW's witness testified that he believed it would be possible to meet DSOD standards and still be economically feasible. (S-R.T., p. 269.)

Water quality requirements also affect the technical and economic feasibility of the DW Project. The question is whether the project is feasible considering the various restrictions placed on discharges from the reservoir islands. For instance, Section 6.1.1 points out that the DOC/TOC loading studies discussed in the REIR/EIS may not accurately reflect the conditions on the reservoir islands. A medium-to-large scale pilot project, or staged development, is recommended before the DW Project or a similar project proceeds with full-scale development. Section 6.1.3 points out that resuspension of organic material during emptying of the reservoir islands may affect yield, and that a restriction on releasing water with substantial amounts of suspended material could render the project infeasible. Additional studies regarding the water quality aspects of the project will determine whether it is feasible.

The permits for the project will require that it be adequately designed, impacts will be mitigated, and a market for its water supply exists so that it can continue to operate for the expected life of the project. These terms will serve the public interest by requiring that the DW Project meet certain requirements before construction and be adequate to avoid adverse effects if it is abandoned after construction. Approving the DW Project will make the water unavailable to subsequent junior water right applicants until and unless the permits are revoked due to failure to complete the project. If the permits are held unused for a period of years, they could discourage other applications from being filed. Consequently, the permits will include a limited time period to complete construction and place the water to beneficial use.

ORDER

IT IS HEREBY ORDERED THAT:

Applications 29061, 29063, 30267, and 30269 (and the petitions to change these applications) to divert water to Bouldin Island and to Holland Tract, having been withdrawn, are ordered canceled. Applications 29062, 29066, 30268, and 30270 (and the petitions to change these applications) are approved, subject to standard permit terms[33] 5i, 10, 11, 12, 13, 14, 15, 21a, 22, 25, 30, 48a, 50a, 63, 91, 95, 115, 203, 207, 208, 213, 214, 215, K2, M, and the following terms and conditions.

1. Construction work shall be prosecuted with reasonable diligence and shall be completed by December 31, 2011. (0000008)

2. Complete application of the water to the authorized use shall be made by December 31, 2011. (0000009)

3. The purposes of use are Domestic, Irrigation, Municipal, Industrial, and Fish and Wildlife.

4. The place of use is the Central Valley Project Service Area, State Water Project Service Area, and Bay-Delta Estuary, as shown on a map on file with the State Water Resources Control Board.

5. The points of diversion and rediversion, and the sources of water are as follows:

   a. Points of Diversion:

      (1) Applications 29062 and 30268 (Webb Tract):

      One (1) point of diversion located between Point A located at California Coordinate Zone 3, N 574,750, E 1,691,450 being within NW¼ of SE¼ of Section 30, T3N, R4E, MDB&M and Point B located at California Coordinate Zone 3, N 571,100, E 1,688,350 being within SW¼ of NW¼ of Section 31, T3N, R4E, MDB&M on the Old River. One (1) point of diversion located between Point B located as described above and Point C located at California Coordinate Zone 3, N 569,050, E 1,669,950 being within SW¼ of SE¼ of Section 33, T3N, R4E, MDB&M on the False River. Three (3) points of diversion located between Point D located at California

[33] A copy of the standard permit terms is available upon request.

Coordinate Zone 3, N578,850, E 1,670,550 being within NW¼ of NE¼ of Section 28, T3N, R3E, MDB&M and Point A located as described above on the San Joaquin River. One point of diversion located at California Coordinate Zone 3, N 571,400, E 1,685,900 being within SW¼ of NE¼ of Section 36, T3N, R3E, MDB&M on the False River. One point of diversion located at California Coordinate Zone 3, N 581,300, E 1,689,900 being within SW¼ of NE¼ of Section 19, T3N, R4E, MDB&M on the San Joaquin River. As shown on maps filed with the State Water Resources Control Board.

(2) Applications 29066 and 30270 (Bacon Island):

Eleven (11) points of diversion located between Point A located at California Coordinate Zone 3, N 548,450, E 1,705,350 being within SW¼ of SW¼ of Section 22, T2N, R4E, MDB&M and Point B located at California Coordinate Zone 3, N 526,400, E 1,702,000 being within NE¼ of NE¼ of Section 16, T1N, R4E, MDB&M on the Middle River. Three (3) points of diversion located between Point B located as described above and Point C located at California Coordinate Zone 3, N 526,650, E 1,694,850 being within NW¼ of NE¼ of Section 17, T1N, R4E, MDB&M on the Santa Fe Dredge Cut. Ten (10) points of diversion located between Point C located as described above and Point D located at California Coordinate Zone 3, N 548,950, E 1,693,400 being within SW¼ of SW¼ of Section 20, T2N, R4E, MDB&M on the Old River. Four (4) points of diversion located between Point D located as described above and Point A located as described above on Connection Slough. One point of diversion located at California Coordinate Zone 3, N 547,400, E 1,692,100 being within NE¼ of NE¼ of Section 30, T2N, R4E, MDB&M on the Old River. One point of diversion located at California Coordinate Zone 3, N 546,600, E 1,703,700 being within NW¼ of NW¼ of Section 27, T2N, R4E, MDB&M on the Middle River. As shown on maps filed with the State Water Resources Control Board.

b. Points of Rediversion (All Applications)

State Water Project Banks Pumping Plant located at California Coordinate Zone 3, N 486,035, E 1,695,057 being within NW¼ of SE¼ of Section 20, T1S, R4E, MDB&M. The Central Valley Project Tracy Pumping Plant located S 76 degrees 39 minutes E, 2674.53 feet from West ¼ Corner of Section 29, T1S, R4E, MDB&M. The Central Valley Project, Entrance to Contra Costa Canal at Rock Slough located N 89 degrees 52 minutes W, 8.9 feet from East ¼ Corner of Section 33, T2N, R3E, MDB&M.

c. Sources:

(1) Applications 29062 and 30268 (Webb Tract):

(a) False River, tributary to San Joaquin River Delta Channels.

(b) San Joaquin River, tributary to Suisun Bay.

(c) Old River, tributary to San Joaquin River Delta Channels.

(2) Applications 29066 and 30270 (Bacon Island):

(a) Old River, tributary to San Joaquin River Delta Channels.

(b) Middle River, tributary to San Joaquin River Delta Channels.

(c) Santa Fe Dredge Cut, tributary to Old River thence San Joaquin River Delta Channels.

(d) Connection Slough, tributary to Middle River thence San Joaquin River Delta Channels.

6. The amounts of water authorized to be appropriated under each of the approved applications are as follows:

a. (1) A30268

The water appropriated shall be limited to the quantity which can be beneficially used. The combined maximum rate of diversion under Applications A30268 and A29062 by direct diversion and/or to offstream storage shall not exceed 4,500 cubic feet per second by direct diversion and diversion to storage. The maximum annual amount diverted to storage shall not exceed 155,000 acre-feet per annum. The season of diversion is January 1 to March 31 and June 1 to December 31 of each year.

The total amount of water to be taken from all sources under Applications A30268 and A29062 shall not exceed 417,000 acre-feet per water year of October 1 to September 30.

(2) A29062

The water appropriated shall be limited to the quantity which can be beneficially used. The combined rate under Applications A30268 and A29062 by direct diversion and/or to offstream storage shall not exceed 4,500 cubic feet per second by direct diversion and diversion to storage. The maximum annual amount diverted to storage shall not exceed 106,900 acre-feet per annum. The season of diversion is December 15 to March 31 of each year.

The total amount of water to be taken from all sources under Applications A30268 and A29062 shall not exceed 417,000 acre-feet per water year of October 1 to September 30.

(3) A30270

The water appropriated shall be limited to the quantity which can be beneficially used. The combined maximum rate under Applications A30270 and A29066 by direct diversion and/or to offstream storage shall not exceed 4,500 cubic feet per second by direct diversion and diversion to storage. The maximum annual amount diverted to storage shall not exceed 147,000 acre-feet per annum. The season of diversion is January 1 to March 31 and June 1 to December 31 of each year.

The total amount of water to be taken from all sources under Applications A30270 and A29066 shall not exceed 405,000 acre-feet per water year of October 1 to September 30.

(4) A29066

The water appropriated shall be limited to the quantity which can be beneficially used. The combined maximum rate under Applications A30270 and A29066 by direct diversion and/or to offstream storage shall not exceed 4,500 cubic feet per second by direct diversion and diversion to storage. The maximum annual amount diverted to storage shall not exceed 110,570 acre-feet per annum. The season of diversion is December 15 to March 31 of each year.

The total amount of water to be taken from all sources under Applications A30270 and A29066 shall not exceed 405,000 acre-feet per water year of October 1 to September 30.

b. Under Applications A30268, A29062, A30270 and A29066 the combined maximum daily average diversion rate shall not exceed 9,000 cubic feet per second and the combined maximum monthly average shall not exceed 4,000 cubic feet per second.

7. Permittee shall install and maintain devices satisfactory to the State Water Resources Control Board to measure the rate and quantity of water diverted into the reservoir from each source, and water released from or flowing out of the reservoir.

(0060046)

8. a. Permittee shall install and properly maintain in the reservoirs continuous recording water stage gages, satisfactory to the State Water Resources Control Board, for the purpose of determining water levels in the reservoirs.

   b. Permittee shall maintain records of the stage gage readings for five years. Such readings shall be available to the State Water Resources Control Board and other interested parties.

(modified (0070047) or (0100047)

9. The State Water Resources Control Board reserves jurisdiction over this permit to change the season of diversion to conform to later findings of the SWRCB concerning availability of water and the protection of beneficial uses of water in the Sacramento-San Joaquin Delta and San Francisco Bay. Any action to change the authorized season of diversion will be taken only after notice to interested parties and opportunity for hearing.

(0000080)

10. This permit is subject to prior rights. Permittee is put on notice that, during some years, water will not be available for diversion during portions or all of the season authorized herein. The annual variations in demands and hydrologic conditions in the Sacramento – San Joaquin Delta are such that, in any year of water scarcity, the season of diversion authorized herein may be reduced or completely eliminated by order of the SWRCB, made after notice to interested parties and opportunity for hearing.

(0000090)

11. a. In order to prevent degradation of the quality of water during and after construction of the project, prior to commencement of construction, permittee shall file a report pursuant to Water Code Section 13260 and shall comply with all waste discharge requirements imposed by the California Regional Water Quality Control Board, Central Valley Region, or by the State Water Resources Control Board.

(0000100)

   b. No water shall be diverted under this permit until permittee has filed a report of waste discharge with the California Regional Water Quality Control Board, Central Valley Region, pursuant to Water Code Section 13260, and the Regional Board or State Water

Resources Control Board has prescribed waste discharge requirements or has indicated that waste discharge requirements are not required. Thereafter, water may be diverted only during such times as all requirements prescribed by the Regional Board or State Board are being met. No point source discharges of waste to surface water shall be made unless waste discharge requirements are issued by a Regional Board or the State Board. A discharge to ground water without issuance of a waste discharge requirement may be allowed if, after filing the report pursuant to Section 13260:

(1) the Regional Board issues a waiver pursuant to Section 13269, or

(2) the Regional Board fails to act within 120 days of the filing of the report.

No permittee shall be required to file a report of waste discharge pursuant to Section 13260 of the Water Code for percolation to ground water of water resulting from the irrigation of crops. (0290101)

12. No construction shall be commenced and no water shall be diverted under this permit until all necessary federal, state and local approvals have been obtained.

(000000J)

13. a. Permittee shall comply with all legally binding requirements of the U.S. Fish and Wildlife Service, National Marine Fisheries Service and California Department of Fish and Game biological opinions on the Delta Wetlands Project required to avoid jeopardy to any listed species under the federal Endangered Species Act (16 U.S.C. §§ 1531-1544). Permittee shall comply with all legally binding requirements of the California Department of Fish and Game 2081 Agreement for the Delta Wetlands Project to avoid jeopardy to any listed species under the California Endangered Species Act (Fish and Game Code §§ 2050-2098) with respect to the Delta Wetlands Project.

b. This permit does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code §§ 2050-2097)

or the federal Endangered Species Act (16 U.S.C.A. §§ 1531-1544). If a take will result from any act authorized under this water right, the Permittee shall obtain authorization for an incidental take prior to construction or operation. Permittee shall be responsible for meeting all requirements of the applicable Endangered Species Act for the project authorized under this permit.

14. a. Discharges of water from the DW Project facilities shall not cause an exceedance of any applicable water quality objective in a water quality control plan adopted by the SWRCB or by the Central Valley Regional Water Quality Control Board. Discharges of water from the DW Project facilities also shall not cause any recipient water treatment plant to exceed the maximum contaminant levels for disinfection byproducts set forth in the regulations adopted by the U.S. Environmental Protection Agency to implement the federal Safe Drinking Water Act, as they current exist or may be amended. (42 U.S.C.A. §§ 300f to 300j-26.) Such regulations are currently set forth at Code of Federal Regulations, title 40, section 141.12, and the maximum contaminant levels are to be measured as set forth at section 141.30 of the above title. Currently, the regulated classes of disinfection byproducts are trihalomethanes, haloacetic acids, chlorite, and bromate.

b. DW Project operations shall not cause or contribute to Total Organic Carbon (TOC) concentrations that violate either of the following criteria: (1) a TOC concentration at a SWP, CVP, or CCWD pumping plant in the southern Delta, or at a receiving water treatment plant, in excess of 4.2 mg/L; (2) a TOC concentration increase at a SWP, CVP, or CCWD pumping plant in the southern Delta higher than 1.0 mg/L. TOC concentrations shall be calculated as a 14-day average. The SWRCB reserves jurisdiction to change the above conditions as necessary after notice to all interested parties and opportunity for hearing. Analytical methods to determine TOC concentration shall conform to the methods specified in Code of Federal Regulations, title 40, section 141.24(e). Samples for TOC analyses shall be collected during normal operating conditions at the entrance point of receiving water treatment plants and at the Delta export pumps.

c. Permittee shall, prior to February 15 of the first year in which it diverts water to storage, prepare an annual operating plan defining general and short-term operating principles, a comprehensive monitoring program, and long and short-term measures to control loading of total organic carbon to Delta channels. Such operating plan shall be prepared with input from CUWA and CCWD and shall be provided to the Chief, Division of Water Rights. The operating plan may be revised from time to time, with notice to the interested parties and to the Chief, Division of Water Rights.

d. Prior to February 15 of the first year in which it diverts water to storage, the Permittee also shall prepare and submit to the Chief, Division of Water Rights, a compliance and monitoring plan. No water may be discharged from the reservoirs until the Chief, Division of Water Rights, has approved the compliance and monitoring plan. The compliance and monitoring plan shall include detailed documentation to define project operational flexibility within the above permit conditions and allow for determination of the cause of any exceedances. The plan shall include the following elements:

- General and short-term operating principles;

- Detailed long and short-term mitigation procedures;

- A detailed and comprehensive monitoring program for the periods when the DW Project is discharging water that identifies parameters to be monitored including chloride, electrical conductivity, dissolved oxygen, flow rate, total dissolved solids, dissolved organic carbon, total organic carbon, and water temperature; sampling locations; sampling frequencies; analytical methods; and quality assurance/quality control procedures in accordance with the analytical methods defined in the SDWA regulations; (40 CFR § 141.135(b).)

- Detailed documentation, with explicitly stated assumptions, of the final predictive computer models (particle-tracking model, water quality model and

water treatment model) that Permittee will use for daily management of DW Project operations;

- Compliance measures to be implemented in the event that discharges from the DW Project facilities coincide with exceedance of the objectives for any of the above parameters.

e. Annually, at the same time that it files its Report of Permittee, Permittee shall file with the Chief, Division of Water Rights a monitoring report containing the monitoring data collected during the discharge periods and a summary of the monitoring data showing the relationship between the measured levels of constituents in the water and the objectives or requirements for the constituents. If a discharge from the DW Project facilities causes or contributes to an exceedance of any applicable objective, Permittee shall immediately notify the Chief, Division of Water Rights, of the exceedance.

f. Thirty days prior to submitting the annual operating plan required by the water quality management plan agreed to by Permittee, CCWD, and CUWA, Permittee shall provide CCWD and CUWA a preliminary review draft of the annual operating plan for review and comment. Permittee shall respond to any comments CCWD provides within fifteen (15) days after receiving the draft, and Permittee shall submit CCWD's comments and its responses to the WQMAB with its annual operating plan. Permittee shall submit any monthly update of the annual operating plan to CCWD in draft form fourteen (14) days in advance of submitting the update to the WQMAB, and shall respond to any comments CCWD provides within seven (7) days after receiving the draft. Permittee shall submit CCWD's comments and its responses to the WQMAB with the update.

15. This permit is subject to the following restrictions:

a. DW Project diversions shall not exceed 1000 cubic feet per second (cfs) when the 14-day running average of X2 is farther than 80 km upstream of the Golden Gate Bridge, nor

exceed 500 cfs if the 14-day running average of X2 is farther than 81 km upstream of the Golden Gate Bridge.[34]

b. In no event shall DW Project diversions to storage exceed twenty-five percent (25%) of the Net Delta Outflow Index.[35] DW Project diversions to storage shall not exceed fifteen percent (15%) of Net Delta Outflow in the months of January, February and March. No DW Project diversions to storage shall be made in April and May, nor shall DW 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 DW Project, using a mathematical model, e.g., Kimmerer and Monismith equations.

c. Permittee shall not at any time cause an increase in chloride concentration at any of CCWD's intakes of more than 10 milligrams/liter (mg/L).

d. Permittee shall not undertake its initial diversions to storage for the current water year (commencing October 1) until X2 has been west of Chipps Island (75 river kilometers upstream of the Golden Gate Bridge) for a period of ten (10) consecutive days.

16. Permittee 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

[34] X2 is the most downstream location of the 14-day running average of a surface water electrical conductivity (EC) of 2.64 mmhos/cm isohaline, determined by interpolating the average daily surface EC measurements at existing Bay-Delta monitoring stations.

[35] The Net Delta Outflow Index shall be calculated as defined in the 1995 Bay-Delta Plan as it may be amended or revised by the SWRCB from time to time, provided that for purposes of DW Project diversions, the Net Delta Outflow calculation shall include the diversions of the DW Project.

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 Right Permits 20749 and 20750.

17. Any diversion by the DW Project to storage that causes the Delta to change from excess to balanced conditions[36] shall be junior in priority to Permits 20749 and 20750 of the Contra Costa Water District.

18. a. No project-related land-disturbing or resource-disturbing activities shall occur until the Historic Properties Management Plan is developed and approved by the consulting parties to the Programmatic Agreement and implemented by Delta Wetlands.

b. For the protection of historic properties, including prehistoric, historic, and architectural properties, the Permittee shall comply with all requirements in the December 22, 1997 "*Programmatic Agreement Among the U.S. Army Corps of Engineers, California State Water Resources Control Board, California State Historic Preservation Officer, Advisory Council on Historic Preservation and Delta Wetlands Properties Regarding Implementation of the Delta Wetlands Properties Project*", issued under section 106 of the National Historic Preservation Act, and Permittee shall comply with it as amended in the future. The Permittee shall continue to consult with the U.S. Army Corps of Engineers, the State Water Resources Control Board, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation, until all stipulations of the Programmatic Agreement and resultant Historic Properties Management Plan have been completed to the satisfaction of all the parties. No project-related land-disturbing or resource-

[36] Excess conditions exist when upstream reservoir releases plus unregulated natural flow exceed Sacramento Valley inbasin uses, plus exports. Balanced conditions exist when the DWR and the USBR agree that releases from upstream reservoirs plus unregulated flow approximately equal the water supply needed to meet Sacramento Valley inbasin uses, plus exports.

disturbing activities will occur until the HPMP is developed and approved by the consulting parties to the PA and implemented by Permittee. Any modifications to the Programmatic Agreement are subject to the approval of the State Water Resources Control Board. The Permittee shall also comply with the *"Procedure for the Protection of Historic and Cultural Properties"* (36 C.F.R. § 60) and the implementing regulations of the Advisory Council on Historic Preservation, 36 C.F.R. § 800.

c. Permittee shall submit an annual progress report regarding the status of implementation of the Programmatic Agreement to the SWRCB, Chief, Division of Water Rights, until such time that the cultural resource work has been completed or these permits are licensed.

d. During development and implementation of the Habitat Management Plans for the islands, the Permittee shall insure that the designs of the habitat management enhancement activities are compatible with the locations of the cultural resources prior to any ground-disturbing activities. If there are any conflicts the cultural resources are to be given priority, in consultations with the consulting archeologists and agencies.

19. a. Permittee shall not discharge water from the reservoir islands if the water discharged has a dissolved oxygen level of less than 6.0 mg/L or would depress the dissolved oxygen level in the adjacent channel of the Delta to less than 5.0 mg/L, or would depress the dissolved oxygen level in the reach of the San Joaquin River between Turner Cut and Stockton to less than 6.0 mg/L during September through November.

b. Permittee shall develop and present to DFG, USFWS, NMFS and the Chief, Division of Water Rights, a real-time monitoring plan to assure compliance with the dissolved oxygen conditions applicable to discharges of water from the DW Project. Permittee shall not release water from the reservoir islands until the monitoring plan has been approved by the Chief, Division of Water Rights.

20. a. To ensure compliance with temperature criteria, Permittee shall prepare a water temperature monitoring plan, in consultation with DFG, NMFS, and USFWS. The plan

shall specify the equipment, locations, and frequency of water temperature measurement, and shall specify the method and frequency of reporting. Permittee shall submit the plan to the Chief, Division of Water Rights, for approval a minimum of 90 days prior to the start of DW Project operation. If the plan is not adequate for the measurement and reporting of water temperatures, Permittee shall revise it according to the direction of the Chief, Division of Water Rights.

b. Permittee shall minimize or avoid any adverse effects to water temperature due to discharge from a reservoir as follows: (i) When the temperature differential between the discharge and receiving water is greater than 20° F, there shall be no discharge. (ii) When channel water temperature is 55° F or higher but is less than 66° F, discharge shall not increase channel temperature by more than 4° F. (iii) When channel water temperature is 60° F or higher but is less than 77° F, discharge shall not increase channel temperature by more than 2° F. (iv) When channel water temperature is 77° F or higher, discharge shall not increase channel temperature by more than 1° F.

c. The SWRCB reserves continuing authority to establish temperature criteria as needed for the protection of fishery resources, if significant water temperature impacts are caused by project operation. Any action taken pursuant to this paragraph will be preceded by notice and an opportunity for hearing.

21. Prior to filling the DW Project reservoirs above mean sea level, Permittee shall provide the Chief, Division of Water Rights, copies of water service contracts with at least one entity to whom water will be delivered under this permit. For each contract, Permittee shall specify the purposes of use, delineate the place of use, and specify the quantities of water to be used so that the Chief can determine that the water will be placed to beneficial use.

22. Prior to diverting water to storage on Bacon Island, Permittee shall establish, through either a judicial determination or through a signed written agreement with PG&E, that it has a right to construct a reservoir on Bacon Island and begin filling it with water. Permittee shall provide a copy of either the court order or the signed agreement to the Chief, Division of Water

Rights before commencing diversions to storage on Bacon Island. Permittee also shall ensure that the following measures are completed:

a. Permittee shall ensure that engineering studies, materials, and construction to securely anchor Line 57A are completed before water is diverted to storage on Bacon Island.

b. Using appropriate equipment during and after levee construction and/or strengthening, Permittee shall ensure that a registered engineer monitors levee settlement and subsidence rates at locations where PG&E's gas pipelines cross Bacon Island levees. Permittee shall ensure that the pipelines are protected from damage due to settlement, subsidence, and construction equipment. During construction and/or strengthening, monitoring shall be conducted twice daily. After levee completion, Permittee shall ensure the conduct of weekly inspections to check for current and potential problems at the gas pipeline crossings, including concerns about levee stability, settlement, and subsidence. If the weekly inspection indicates settlement, erosion, or slumping at the gas pipelines, Permittee shall notify PG&E and shall implement corrective measures to maintain the required levee stability near the gas lines. Commencing on the date when the water right applications are approved, any levee maintenance and/or improvement activities shall be considered to be levee construction or strengthening for the purpose of this condition.

c. Permittee shall implement measures to minimize the risk of pipeline failure during levee construction and/or strengthening. Permittee shall be responsible for maintenance associated with installation of new pipeline segments under Bacon Island levees or implementation of other appropriate measures needed to prevent or repair damage to the gas pipeline due to increased bending or shear loads at levee crossings during levee construction and/or strengthening and settlement or damage due to construction equipment.

d. Permittee shall provide access to PG&E to monitor the construction and/or strengthening activities in the areas of the PG&E pipelines.

e. Permittee shall provide adequate facilities on Bacon Island for PG&E's annual pipeline inspection. Permittee shall provide a suitable ramp and turnaround facilities to launch a boat for regular pipeline inspections, and shall provide a suitable staging area for equipment and materials needed for gas pipeline repairs.

f. Pursuant to consultation with PG&E, Permittee shall relocate the cathodic protection test stations on Bacon Island to the perimeter levee system and shall provide PG&E and the SWRCB access to the relocated cathodic protection test stations. Permittee shall, before relocating the cathodic protection test stations, prepare a plan for the relocation work and submit it to the Chief, Division of Water Rights for approval, and shall provide a copy to a designated representative of PG&E. Permittee shall do the work in accordance with the plan as approved.

g. Permittee, in coordination with PG&E, shall permanently relocate the existing electrical transmission lines on Webb Tract to the improved perimeter levees during project construction. The new or relocated transmission lines would be located along perimeter levees and would be installed overhead near the toe of the new slopes, similar to existing installations. Before temporarily or permanently modifying or relocating existing electrical lines, Permittee shall conduct special-status plant surveys in areas that could be affected by the proposed modifications. If threatened or endangered plant species are found, Permittee shall avoid disturbing those plants when making changes to existing electrical lines.

h. Permittee, in coordination with PG&E, shall extend existing electrical transmission lines on the reservoir islands where needed to serve new siphon and pump stations and recreation facilities. Before modifying existing electrical lines, Permittee shall conduct special-status plant surveys in areas that could be affected by the proposed modifications. If threatened or endangered plant species are found, Permittee shall avoid disturbing those plants when making changes to existing electrical lines.

23. a. Permittee shall have the DW Project levees and seepage control system designed and signed off by a licensed professional engineer qualified in the design of levees and seepage control systems in an estuary.

b. During the operating life of the DW Project, and as long as it is capable of storing water, Permittee shall maintain a general liability insurance policy in an amount that the insurer deems adequate to pay the maximum reasonable damages that may be caused to owners of property on nearby islands in the Delta or to individuals due to the effects on levee stability, seepage, public utilities, and current land uses in the Delta of the DW Project design, construction, or operation. Permittee shall provide proof of such insurance to the Chief, Division of Water Rights. Such insurance policy shall include a provision under which the insurer reviews the policy every three years to determine whether the amount of insurance is adequate, and shall include a provision requiring the insurer to notify the Chief, Division of Water Rights, if the policy is cancelled or lapses. This term shall not apply to Permittee if Permittee is an agency of the State of California or of the United States.

c. Permittee shall implement seepage control measures as set forth in the Project description, which shall mitigate Impact D-2 in the EIR, including:

(1) No borrow area shall be located closer than 800 feet from the toe of the levee on the reservoir islands when the adjacent islands could be impacted.

(2) Permittee shall install interceptor wells, relief wells or some other engineering design to maintain the hydraulic heads beneath the levees of the adjacent islands within existing conditions.

24. a. Permittee shall comply with all terms and conditions set forth in the January 27, 1997 Final Operations Criteria and Fish Monitoring Program approved by the U.S. Fish and Wildlife Service, National Marine Fisheries Service and California Department of Fish and Game pursuant to their responsibilities under the federal and state Endangered Species Acts. If the U.S. Fish and Wildlife Service, National Marine Fisheries Service

and California Department of Fish and Game all authorize a change in the Final Operations Criteria, the Permittee shall comply with the criteria as changed.

b. Permittee shall comply with the following fisheries terms and conditions for the protection of Mokelumne salmonids, as set forth below:

(1) Webb Tract Operations: From January 1 to June 30, Permittee's Webb Tract operations shall be in accordance with the following diversion protocol:

(a) Diversions to storage shall be made through the southeastern siphon station, except that 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.

(b) 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.

(c) 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 a 30-day period. 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.

(d) This diversion operations protocol shall not apply (1) if the U.S. Fish and Wildlife Service ("USFWS") determines that delta smelt eggs, larvae, juvenile or adult life stages are at or near the Webb Tract southeastern siphon monitoring stations[37], or (2) if the 3-day running average of salinity or

[37] See the USFWS Final Biological Opinion.

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. 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.

(e) 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.

(f) Any additional siphons or screening capacity constructed by Permittee will be subject to the diversion protocol. Any additional siphons or screening capacity will be added to the southeastern siphon station whenever possible.

(2) Siphon Removal:

(a) 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.

(b) 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.

(c) Permittee shall complete the above-referenced siphon removal before beginning diversions on Webb Tract under this permit. Permittee shall provide EBMUD with written notice of removal within thirty days of completion of siphon removal.

25. a. Permittee shall develop a construction mitigation plan for the reservoir islands following development of detailed project construction schedules, specifications, and plan drawings for construction of project infrastructure, pumps and siphons, enlarged levees, and recreation and other facilities. The plan shall be submitted to SWRCB and DFG for approval. Disagreements between Permittee and DFG during the plan approval process may be submitted to the Chief, Division of Water Rights, for resolution. **(**Mitigation Measure H-1)

(1) The construction mitigation and monitoring plan shall identify methods to avoid impacts on nesting Swainson's hawks, roosting greater sandhill cranes, and nesting California black rails. These methods shall include conducting preconstruction surveys to locate nesting and roosting sites of these species and may include measures such as avoiding construction during sensitive use periods.

(2) Elements of the plan shall identify:

- preconstruction survey protocols to locate Swainson's hawk nest sites and greater sandhill crane roosts on reservoir islands and nesting California black rails on the water side of perimeter levees;

- measures to avoid affecting state-listed wildlife species, including restriction of construction activities to areas at least 200 yards from nesting California black rails;

- construction monitoring methods and schedule to be implemented to ensure compliance with the construction mitigation plan; and

- potential remedial measures to compensate for impacts incurred during construction that are not identified in the HMP.

Following construction, Permittee shall submit a report describing success of the construction impact avoidance measures to the Chief, Division of Water Rights, and DFG.

b. For Bouldin Island, Permittee shall develop a monitoring program in consultation with DFG and the HMAC and implement the program to determine whether airstrip use on hunt days has a deleterious effect on greater sandhill cranes or waterfowl. The plan shall be submitted to the Chief, Division of Water Rights, within one year of issuance of project operation permits. (Mitigation Measure H-2)

The major elements of the monitoring plan shall be:

- criteria for evaluating monitoring data that will be used to determine whether use of the airstrip on hunt days is having a significant impact on greater sandhill cranes and waterfowl,

- criteria for determining appropriate mitigation requirements for offsetting significant impacts based on the level of impact airstrip use has on these species,

- a detailed description of monitoring protocols, and

- a monitoring schedule that estimates when data would be sufficient to determine whether airstrip use on hunt days has significant impacts on greater sandhill cranes or waterfowl.

If, based on monitoring results, airstrip use on hunt days is found to have a significant impact on greater sandhill cranes or waterfowl, DFG, in consultation with the HMAC, may recommend to the Chief, Division of Water Rights, that airstrip use be modified to

ensure that the goals for establishment of the closed hunting zone are met. Depending on the level of impact, recommendations could include closing hunting on Bouldin Island during the landing and takeoff period, restricting the number of flights permitted per day, changing the landing and takeoff period to reduce impacts, or closing the use of the airstrip on hunt days. Conversely, if monitoring indicates that there is no significant impact on greater sandhill cranes or wintering waterfowl, DFG, in consultation with the HMAC, could recommend that the proposed initial aircraft use restrictions remain in place or be reduced.

c. Permittee shall retain a qualified biologist to monitor waterfowl use areas on the DW Project islands to locate incidences of waterfowl disease mortalities. Permittee, in cooperation with DFG and USFWS, shall develop management strategies to be employed in the event of disease outbreaks. Upon identification of a disease outbreak, Permittee shall notify DFG and, in cooperation with DFG biologists, implement management strategies to reduce waterfowl mortality. Management actions may include removing carcasses from the Permittee islands, hazing waterfowl from the islands, or draining waterfowl habitats. **(**Mitigation Measure H-3)

Management strategies shall include descriptions of:

- methods used to monitor waterfowl to detect disease outbreaks,
- protocols for determining when and what types of management actions to reduce the incidence of disease would be implemented,
- methods for collecting carcasses and removing them from affected areas,
- potential locations and methods for disposal of collected carcasses, and
- methods to haze waterfowl from reservoir islands.

d. Permittee shall conduct special-status plant surveys before construction of project facilities and shall site facilities to avoid special-status plant populations. (Mitigation Measure G-1)

e. To mitigate potential indirect impacts of construction, Permittee shall use several measures to protect special-status plants that are within 200 feet of project facility sites. First, the boundaries of each population shall be determined and marked with surveyor's flagging. Second, special-status plants within 100 feet of project facility sites shall be protected by temporary barricades erected 50 feet from the edge of the population nearest to the facility site.

Plants 100-200 feet from the construction sites shall be identified with brightly colored flagging on vegetation and/or surveyor's stakes that are plainly visible to construction personnel approaching the area occupied by the plants. Flagging shall not be obscured by vegetation. Construction crews and Permittee maintenance personnel must be informed of the presence of the plants, the function of the barricades and flagging, and the strict avoidance requirements.

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, Permittee shall contact DFG and negotiate appropriate mitigation to offset impacts. **(**Mitigation Measure G-2)

f. Permittee, in consultation with SWRCB, DFG, and USFWS, shall develop and implement a plan for mitigating unavoidable impacts on special-status plant populations. No diversion shall be permitted until California Endangered Species Act consultations have been completed, a no-jeopardy opinion has been issued by DFG, and a mitigation plan and mitigation implementation schedule have been approved by the Chief, Division of Water Rights. **(**Mitigation Measure G-3)

g. This permit is subject to the continued operation and management of the habitat management lands, consisting of approximately 9,000 acres of land on Bouldin Island and on Holland Tract, pursuant to the Habitat Management Plan set forth as Appendix G3 of the draft EIR. (SWRCB 2, App. G3.) This term shall remain in effect, regardless of whether the habitat management lands are owned and operated by Permittee.

26. a. Before doing any construction, including any earth moving activities, Permittee shall conduct an investigation to determine the location and extent of any sites of contamination or pollution on Bouldin Island, Holland Tract, Webb Tract and Bacon Island. The investigation shall include a historical review of the islands, including a history of any above ground or underground tanks, pesticide use and storage, and any sumps, ponds, or landfills that may have received waste. After areas of potential sources of contamination or pollution have been identified, Permittee shall submit to the Regional Board and the County Health Department for San Joaquin County or Contra Costa County a work plan for a further investigation. The work plan shall include the site history, potential source areas, and an investigation plan (e.g. collect soil samples, groundwater samples, etc.).

b. Permittee shall not use onsite soils for levee construction until the Regional Board has determined that the soils do not pose a threat to water quality.

27. Permittee shall operate the DW Project to avoid cumulative hydrodynamic effects in the channels of Middle River and Old River during flows that are higher than historical flows.

28. Permittee shall comply with all legally binding requirements imposed under Section 401 of the Clean Water Act. (42 U.S.C.A. § 1341.)

29. Permittee shall comply with mitigation measures B-1, C-1 through C-3, C-8 and C-9, J-1 thorugh J-3, L-1 through L-3, N-1, and O-1 through O-4 of the EIR.

30. The issuance of this permit does not limit Delta Wetlands' existing water rights on any of its four islands.

31. Permittee shall include in any contract for sale of water a provision that the purchaser must enter into the appropriate statewide memorandum of understanding that guides water conservation practices.

32. a. This permit is junior in priority to any permit or license issued on any application regardless of application date that authorizes the provision of water for beneficial uses within Amador County.

b. This permit is 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 inhabitants or property owners therein.

c. Permittee shall not operate the Delta Wetlands Project reservoir islands if the water quality criteria for salinity in effect pursuant to the "Contract Between State of California Department of Water Resources and North Delta Water Agency for the Assurance of a Dependable Water Supply of Suitable Quality" dated January 28, 1981, as amended, are not being met, until Permittee can demonstrate, to the reasonable satisfaction of North Delta Water Agency, that DW Project reservoir operations are not adversely affecting salinity levels at any of the monitoring locations established by that Contract.

33. a. No diversion is authorized that would adversely affect the operation of the federal Central Valley Project or the State Water Project under permits and licenses for these Projects as they exist at the time of this Order and as they may be amended from time to time. An adverse effect shall be deemed to result from Permittee's diversion when:

(1) the USBR and the DWR have declared the Delta to be in balanced water conditions under the Coordinated Operation Agreement (COA)[38]; or

[38] Referring to "Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project, November 4, 1986," and as it may be amended.

(2) at any other time the diversion would directly or indirectly require the CVP or the SWP to release water from storage or reduce their diversion or rediversion of water from the Delta in order to provide or assure flow or water quality in the Delta to meet any applicable federal or state law or mandate.

b. When USBR and DWR have declared the Delta to be in excess water conditions under the COA, no diversion is authorized by Permittee greater than the amount of excess water available as reasonably calculated by USBR and DWR.

c. Permittee shall curtail or cease discharges from Delta Wetlands' reservoirs which would directly or indirectly require operations of the SWP or CVP to be modified to meet any applicable federal or state law or mandate.

34. a. No discharge for export under water rights established under this permit is authorized prior to the execution of a formal agreement(s) among USBR, DWR, and Permittee, for surplus Delta export capacity at the SWP and CVP pumping plants and incorporating operations coordination procedures consistent with the Delta Wetlands Operating Criteria and Plan, Endangered Species Act Requirements, Public Law 102-575, Title 34, the 1995 Water Quality Control Plan, the 1986 Agreement Between the United States and State of California for Coordinated Operation of the CVP and SWP and any amendments thereto. The formal agreement(s) shall recognize SWP and CVP pumping priorities, Endangered Species Act requirements and any State or Federal regulatory limitations as well as costs attendant to the export pumping.

b. Before filling the DW Project reservoirs above mean sea level, Permittee shall demonstrate to the satisfaction of the Chief, Division of Water Rights, that the water to be developed by the DW Project can reliably be wheeled.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a decision duly and regularly adopted at a meeting of the State Water Resources Control Board held on .

AYE:

NO:

ABSENT:

ABSTAIN:

Maureen Marché
Administrative Assistant to the Board