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 6 Resources

7  
 8 **BEFORE THE**  
 9 **CALIFORNIA STATE WATER RESOURCES CONTROL BOARD**

10 HEARING IN THE MATTER OF CALIFORNIA  
 DEPARTMENT OF WATER RESOURCES  
 11 AND UNITED STATES BUREAU OF  
 RECLAMATION REQUEST FOR A CHANGE  
 12 IN POINT OF DIVERSION FOR CALIFORNIA  
 13 WATER FIX

TESTIMONY OF JENNIFER PIERRE

14  
 15 I, Jennifer Pierre, do hereby declare:

16 I. INTRODUCTION

17 My name is Jennifer Pierre and I am employed as a Principal with ICF International.  
 18 I received a Bachelor's of Science in Environmental Biology and Management from the  
 19 University of California at Davis in 2003. I have been employed by ICF for over 13 years  
 20 and am currently serving as the Consultant Deputy Program Manager for California  
 21 Department of Water Resources (DWR) Bay Delta Conservation Plan/California WaterFix  
 22 (CWF). I was previously the Consultant Project Manager for several DWR projects in the  
 23 Delta. I began my assignment with DWR in 2011. As part of my duties for the CWF, I  
 24 assist DWR and the United States Bureau of Reclamation (Reclamation) in developing and  
 25 refining the project description, including various operational scenarios for the CWF. I also  
 26 managed the preparation of the Fish and Aquatic Resources Chapter for the CWF  
 27 Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS). In addition,  
 28

1 I managed the preparation of the January 2016 draft Biological Assessment. Attached as  
2 Exhibit DWR-11 is a true and correct copy of my Statement of Qualifications.<sup>1</sup>

3 II. OVERVIEW OF TESTIMONY

4 My testimony provides an overview of the project description for the CWF that is the  
5 subject of the Petition for Change in Point of Diversion submitted on August 26, 2015, by  
6 DWR and the U.S. Bureau of Reclamation.

7 My testimony will briefly describe the current configuration and operations of the  
8 State Water Project (SWP) and Central Valley Project (CVP) (collectively, SWP/CVP or  
9 Projects), including the current regulatory framework and generally describe the CWF new  
10 facilities and changes to existing facilities. I will introduce and briefly describe the analytical  
11 framework used to prepare our testimony that is intended to address the key issues for Part  
12 1 of this hearing. This will include an overview of the existing operational criteria, a  
13 presentation of the new operational criteria, and an introduction of the criteria used to  
14 develop the boundary approach set forth in other testimony.

15 I will also provide a brief background on development of certain criteria in order to  
16 provide necessary context. Although, in-depth discussion of the biological justification for  
17 specific operational criteria will be discussed in Part 2. I will also introduce real time  
18 operations (RTO) that are discussed in Mr. Leahigh's testimony; and discuss how following  
19 issuance of the amendments to the permits authorizing the change in point of diversion, the  
20 process adaptive management will be used to adjust operations in light of new science.

21 III. PROJECT DESCRIPTION

22 The proposed change in point of diversion for consideration by the State Water  
23 Board adds three new diversion points to water right permits held by DWR and  
24 Reclamation.<sup>2</sup> DWR and Reclamation have not requested any changes to the permit  
25 source of water, quantities, rates of diversion, timing of diversion, place of use, and  
26

27 <sup>1</sup> DWR-11 is a true and correct copy of the document.

28 <sup>2</sup> DWR permit numbers 16478, 16479, 16481, 16482; Reclamation permit numbers 11315, 11316, 12721,  
12722, 12723, 11967, 11968, 11969, 11971, 11973, 12364.

1 purpose of use. The three new diversion points would allow for future operation of  
2 proposed intakes at three locations between Clarksburg and Courtland on the Sacramento  
3 River, each with a maximum physical capacity of 3,000 cfs. The three proposed intakes  
4 would supply water to the SWP and CVP (collectively, SWP/CVP) and provide SWP/CVP  
5 operators with increased flexibility by virtue of dual-conveyance, or in other words the ability  
6 to divert water from either the existing southern Delta points of diversion or the proposed  
7 northern Delta points of diversion, based upon biological, hydrodynamic, water quality and  
8 water supply considerations. Proposed operations with a dual conveyance system would  
9 include new or additional criteria related to Old River and Middle River flows, Head of Old  
10 River Gate (HORG) operations, Delta outflow, and north Delta bypass flows, and would  
11 comply with SWP/CVP permit requirements.

#### 12 IV. SWP BACKGROUND

13 Following is a brief description of current SWP infrastructure, coordinated  
14 operations, and regulations pertaining to SWP/CVP. Real time operations are used by  
15 SWP/CVP to satisfy their permit obligations as will be further described by Mr. Leahigh's  
16 testimony.

#### 17 A. EXISTING SWP INFRASTRUCTURE

18 The California SWP is the nation's largest state-built water conveyance and power  
19 development system. It includes multiple facilities, including pumping and power plants;  
20 reservoirs, lakes, and storage tanks; and canals, tunnels, and pipelines that capture, store,  
21 and convey water to 29 water agencies throughout California. The operation of the system  
22 to divert and store SWP water is conditioned by water rights permits issued to DWR by the  
23 State Water Resources Control Board. DWR's rights to appropriate and store water are  
24 explained in detail in Ms. Sergent's testimony. The mountains and waterways  
25 encompassing the Feather River watershed collect runoff from rain and snow that fills Lake  
26 Oroville, the SWP's primary water conservation facility. DWR has rights to directly divert  
27 water from the Sacramento watershed as well as to store water in Oroville Reservoir.  
28

1 When water is needed, water is released from Lake Oroville and flows down the Feather  
2 River to the Sacramento River then into the Sacramento-San Joaquin Delta (the Delta).<sup>3</sup>  
3 Some of the water is pumped into the North Bay Aqueduct, which serves Napa and Solano  
4 counties. Some is drawn into the South Delta and into Clifton Court Forebay (CCF) where it  
5 is channeled into the Harvey O. Banks pumping plant and pumped into the California  
6 Aqueduct for delivery to points west and south. However, before any water is diverted  
7 under the SWP water right permits to deliver water under DWR's long term contracts, DWR  
8 must comply with the terms of its permit.

9 B. SWP/CVP OPERATIONS AND CURRENT REGULATORY  
10 REQUIREMENTS

11 The Bay-Delta Water Quality Control Plan (WQCP)<sup>4</sup> identifies the beneficial uses of  
12 water in the Delta and establishes the objectives necessary to protect those beneficial  
13 uses. The current WQCP, as implemented through Water Rights Decision 1641 (D-1641),  
14 requires the Projects to meet the protective standards established by the State Water  
15 Board. (Exhibit SWRCB-21.) DWR and Reclamation's water rights permits for the  
16 SWP/CVP incorporate the applicable requirements of D-1641. DWR and Reclamation  
17 closely coordinate SWP/CVP operations, respectively, to meet their obligations.

18 In addition to water right permit terms, DWR and Reclamation operate the SWP/CVP  
19 pursuant to Biological Opinions (BiOp(s)) issued by the USFWS and NMFS under the  
20 Endangered Species Act (ESA). (Exhibits SWRCB-87; SWRCB-83, SWRCB-84.) DWR  
21 operates the SWP pursuant to an incidental take permit for the protection of longfin smelt  
22 issued by the California Department of Fish and Wildlife (CDFW) under the California Fish  
23 and Game Code, section 2081(b) (the 2081(b) permit) and consistency determinations  
24 issued under the California Fish and Game Code, section 2080.1 (Exhibits SWRCB-65,  
25

26 <sup>3</sup> The Delta refers to the legal Delta as defined in California Water Code Section 12220.

27 <sup>4</sup> The full title of the current Bay-Delta Water Quality Control Plan is Water Quality Control Plan for the San  
28 Francisco Bay/San Joaquin-Sacramento Delta Estuary. The WQCP was adopted in 1995 and was amended  
in 2006 without substantive changes. The State Water Board is in the process of a periodic update of the  
WQCP, which is occurring in phases.

1 DWR-103, DWR-104)<sup>5</sup>.

2 IV. PROJECT DESCRIPTION

3 A. OBJECTIVES

4 The Delta is a vitally important ecosystem that supports hundreds of aquatic and  
5 terrestrial species, some of which are threatened or endangered. California's two major  
6 watersheds of the Sacramento River and San Joaquin River meet in the Delta, which is the  
7 hub of the SWP/CVP water system. Unfortunately, Delta levees and the infrastructure they  
8 protect are at risk from earthquake damage, continuing land subsidence, and rising sea  
9 level. (Exhibit SWRCB-4, Chapter 2, pp. 2-3 through 2-7.) In addition, pursuant to federal  
10 and state endangered species laws, the USFWS, NMFS, and CDFW have issued BiOps  
11 and incidental take permits requiring DWR and Reclamation to substantially alter the  
12 manner in which they jointly operate the SWP/CVP facilities for protection of listed species,  
13 and independent of drought, which has reduced deliveries and reliability of water supplies  
14 south of the Delta.

15 There is a need to improve and modernize the existing Delta conveyance system  
16 and address the above concerns. Many of the challenges with the current water delivery  
17 system could be improved by the construction and use of proposed North Delta Diversion  
18 (NDD) structures with state-of-the-art fish screens operating in coordination with the  
19 existing south Delta SWP/CVP facilities. As such, DWR and Reclamation propose the  
20 CWF, with the fundamental purpose to make physical and operational improvements to the  
21 system that are necessary, as described in the EIR/EIS, to restore and protect ecosystem  
22 health, water supplies of the SWP and CVP south of the Delta, and water quality within a  
23 stable regulatory framework, consistent with statutory and contractual obligations. The  
24 objectives of the CWF stem from the fundamental purpose of the CWF to address adverse  
25 effects to state and federally listed species and address water supply reliability.

26 ///

27 \_\_\_\_\_  
28 <sup>5</sup> Exhibits DWR-103 and DWR-104 are true and correct copies of the documents.

1 B. SUMMARY OF CWF SPECIFIC BACKGROUND

2 DWR and Reclamation in coordination with several state and federal water  
3 contractors have proposed the CWF as a strategy for addressing ecological concerns in the  
4 Delta while improving water supply reliability in California. These agencies' initial approach  
5 goes back to 2006, and focused on the addition of new intakes in the north Delta while at  
6 the same time pursuing a very large scale long-term habitat restoration program within the  
7 greater Delta. This approach was captured in the Bay Delta Conservation Plan, or BDCP,  
8 which proposed implementing a suite of conservation measures addressing multiple  
9 stressors on fish and wildlife that covered both state and federal listed and non-listed  
10 species pursuant to ESA habitat conservation plans and the state Natural Community  
11 Conservation Planning Act. (Exhibit SWRCB-4.) In 2007 one of the twelve integrated and  
12 linked Delta Vision recommendations by the Blue Ribbon Task Force, recognized as a  
13 "fundamental action," was new SWP/CVP conveyance. The Task Force concluded that,  
14 "new facilities for conveyance and storage, and better linkage between the two, are needed  
15 to better manage California's water resources for both the estuary and exports." (Exhibit  
16 DWR-106.)<sup>6</sup> Likewise, in 2006 the State Water Board recommended that "DWR and USBR  
17 should continue their efforts to develop alternative water conveyance." (Exhibit SWRCB-  
18 27. p. 28.)

19 In 2000, in adopting the CALFED Record of Decision, the CALFED agencies agreed  
20 that the through-Delta conveyance approach is appropriate if the CALFED "purposes  
21 cannot be fully achieved." (Exhibit DWR-107<sup>7</sup>.) During the development of the BDCP both  
22 the legislature, through the 2009 Sacramento-San Joaquin Delta Reform Act, and the  
23 Governor, in his 2014 California Water Action Plan, contemplated new conveyance as part  
24 of a Delta solution. (Exhibit DWR-109<sup>8</sup>.)

25 In 2012, the Administrative Draft for the proposed BDCP was released. In  
26

27 <sup>6</sup> Exhibit DWR-106 is a true and correct copy of the document.

28 <sup>7</sup> Exhibit DWR-107 is a true and correct copy of the document.

<sup>8</sup> Exhibit DWR-109 is a true and correct copy of the document.

1 December 2013, after several years of preparation, DWR, Reclamation, USFWS, and  
2 NMFS, acting as joint Lead Agencies, published the Draft EIR/EIS on the proposed BDCP.  
3 (Exhibit SWRCB-4.) This document contained a total of 15 action alternatives, including  
4 Alternative 4, which was identified as DWR's preferred alternative. The 14 other action  
5 alternatives varied from Alternative 4 with respect to factors such as the number of  
6 proposed north Delta intakes, the types of conveyance facilities (e.g., surface canals versus  
7 underground pipelines), operational rules, and amounts of proposed habitat restoration.  
8 Alternative 4 includes three new intakes located in the north Delta and two parallel  
9 underground pipelines conveying diverted water to the existing export facilities in the South  
10 Delta. The proposed operational rules for Alternative 4 reflect many years of coordination  
11 between DWR, Reclamation, the state and federal water contractors, USFWS, NMFS, and  
12 CDFW.

13 In April 2015 DWR and Reclamation announced, consistent with public comments  
14 received in 2014, substantial modifications to the proposed conveyance facilities with  
15 additional alternatives to reduce project footprint impacts and changed the permitting  
16 approach under the ESA and California Endangered Species Act (CESA) from the habitat  
17 conservation planning effort of the HCP/NCCPA to section 7 and 2081(b) permitting.  
18 Under this new approach, Reclamation and DWR have prepared a draft Biological  
19 Assessment (BA) that, after it is finalized, will be submitted to USFWS and NMFS to obtain  
20 a BiOp for the combined SWP/CVP CWF operations. DWR also will submit to DFW an  
21 application for a CESA 2081(b) permit for CWF. The operational criteria described in the  
22 draft BA and 2081(b) application were developed in coordination with the fish and wildlife  
23 agencies and are based on criteria originally developed with the agencies for the BDCP.

24 Among the key changes made in 2015 are: (i) the elimination of each pumping plant  
25 associated with each intake facility; (ii) associated reductions in construction-related  
26 activities that caused higher air pollutant emissions at intake sites; (iii) the relocation of key  
27 project features from private property to public property already owned by DWR; (iv)  
28

1 substantial reductions in the amount of construction occurring on Staten Island; (v)  
2 reductions in water quality effects, such as leaving the compliance point at Emmaton and  
3 the 3,000 cfs rate of diversion from the south of Delta in the summer; (vi) incorporation of  
4 the decision tree concept in an adaptive management program; and (vii) undertaking  
5 substantial habitat restoration in another program, known as California EcoRestore. DWR  
6 and Reclamation also formulated three new Alternatives for analysis in the environmental  
7 document identified as alternatives 4A, 2D and 5A (CWF is known as Alternative 4A). In  
8 July 2015, DWR and Reclamation issued a Partially Recirculated Supplemental Draft  
9 Environmental Impact Report/Supplemental Draft Environmental Impact Statement  
10 (RDEIR/SDEIS) that analyzed the environmental effects of the project changes and new  
11 alternatives. (Exhibit SWRCB-3.)

12 The construction and operation of new conveyance facilities, as now proposed under  
13 the CWF, implement a dual conveyance system, in which SWP/CVP water could be  
14 diverted from either the north or the south diversion locations, or both, depending on the  
15 operational criteria. The coordinated operations of the dual conveyance system will align  
16 water operations to better reflect natural seasonal flow patterns. Reducing south Delta  
17 pumping would provide more natural east–west flow patterns. Additionally, the NDD will be  
18 equipped with state-of-the-art fish screens and are located outside the main range of both  
19 Delta Smelt and Longfin smelt. The new system would address challenges associated with  
20 sole reliance on the existing south Delta diversion facilities and allow for greater operational  
21 flexibility to capture water during high flow events where pumping in the south Delta would  
22 otherwise be restricted. In addition, the NDD would also help protect critical water supplies  
23 against the threats of sea level rise and earthquakes.

#### 24 C. SUMMARY OF CWF PHYSICAL COMPONENTS

25 In this section I will provide a short summary of the physical components of the  
26 CWF. Additional and more detailed information will be provided in the later engineering  
27 testimony by Mr. Bednarski. The proposed physical facilities in the north Delta include  
28

1 three intake facilities along the east bank of the Sacramento River between Clarksburg and  
2 Courtland and two tunnels that will carry water from the intake facilities to CCF before being  
3 pumped into the SWP California Aqueduct and CVP Delta Mendota Canal for delivery to  
4 points south. Under the CWF, DWR and Reclamation will continue to use the existing  
5 South Delta facilities as appropriate and in coordination with the north Delta facilities.

6 Each intake has a maximum capacity to divert 3,000 cfs (a total of 9,000 cfs from the  
7 NDD), although actual operations will be governed by the operational criteria and based on  
8 hydrologic conditions and fish presence. An intermediate forebay would be constructed for  
9 water diverted from the NDD, with a tunnel connecting from intakes 2 and 3 and a second  
10 tunnel connecting from intake 5. From the intermediate forebay, two 30-mile tunnels would  
11 carry water to the CCF. A new pumping plant at CCF would be constructed to draw water  
12 from the end of the new tunnels up into CCF. The CCF would be expanded to the south  
13 and split into north and south sections to receive the "fish free" water from the NDD and  
14 keep it separate from water diverted from the existing south Delta facilities. Water from the  
15 NDD would be received in the northern section of CCF. In addition, an operable gate will  
16 be constructed at the HORG. The HORG will be located at the divergence of Old River and  
17 the San Joaquin River in place of the existing rock barrier.

18 As described in the EIR/EIS, the project includes a suite of Environmental  
19 Commitments primarily in the form of habitat restoration, protection, enhancement, and  
20 management activities necessary to mitigate for adverse effects from construction of the  
21 proposed water conveyance facilities. More specifically, the footprint mitigation proposed in  
22 the draft biological assessment includes: 159 acres of tidal wetland habitat suitable for  
23 Delta Smelt, 185 acres of tidal wetland habitat suitable for green sturgeon and 185 acres of  
24 tidal wetland habitat suitable for chinook salmon and steelhead, and 4 miles of channel  
25 margin enhancement to offset the footprint and operational impacts from construction of the  
26 intake facilities. The channel margin habitat can be sited to avoid existing river-bank  
27  
28

1 structures such as existing water diversions. (Exhibit DWR-115<sup>9</sup>.)

2 D. RATIONALE FOR BOUNDARY APPROACH

3 The CWF presented to the State Water Board is Alternative 4A, the preferred  
4 alternative from the RDEIR/SDEIS. Alternative 4A is described by initial operational criteria  
5 that provides for a range of outflows. This range is described as initial operational  
6 scenarios H3 and H4. However, prior to operation of the project, there will be specific initial  
7 operating criteria as set forth in the CWF BiOp. These criteria may change based on  
8 adaptive management. Since the BiOp has not been issued, and DWR and Reclamation  
9 do not know the initial operational criteria the analytical framework presented for Part 1 is a  
10 boundary analysis. The boundary analysis will provide a broad range of operational criteria  
11 and the initial operating criteria will fall within this range. These boundaries are sufficiently  
12 broad so as to assure the State Water Board that any operations considered within this  
13 change petition proceeding have been evaluated with regard to effects on legal users of  
14 water. These boundaries are described below as boundary 1 and boundary 2. Exhibit  
15 DWR-114 provides an overview of this analytical framework<sup>10</sup>. However, these boundaries  
16 do not represent the proposed project.

17 a. Alternatives Analyzed in the EIR/EIS

18 Agencies rendering their various approvals and permitting decisions associated with  
19 the CWF must also comply with CEQA or NEPA and consider the effects of the project on  
20 the environment. The EIR/EIS provides this analysis for compliance with CEQA and  
21 NEPA.

22 Because permitting requirements will not be known with certainty until the actual  
23 permits have been issued, and because the approving agencies need to consider a  
24 reasonable range of alternatives, the EIR/EIS includes a number of different operating  
25 scenarios that capture a wide range of operational alternatives. The operating scenarios  
26 evaluated, in conjunction with the proposed CWF conveyance improvements, in the EIR/S

27 <sup>9</sup> Exhibit DWR-115 is a true and correct copy of the document.

28 <sup>10</sup> Exhibit DWR-114 is a true and correct copy of the document.

1 include:

- 2 • The initial operating criteria anticipated to be required for the proposed project  
3 for ESA and CESA permitting purposes, and which are presented in the  
4 RDEIR/SDEIS, Chapter 4, with Alternative 4A (the proposed project) as a  
5 range between Operating Scenario H3 and Scenario H4.
- 6 • A “high-outflow” scenario requested by the State Water Board.<sup>11</sup> This  
7 scenario is included as Alternative 8 in the 2013 DEIR/EIS, and revisions to  
8 that scenario that is presented in Appendix C to the RDEIR/SDEIS. As noted  
9 in Appendix C of the RDEIR/SDEIS, an alternative that includes the High  
10 Outflow operational scenario would not meet the project objectives or purpose  
11 and need statement. RDEIR/SDEIS, Appendix C, Section C.1 explains State  
12 Water Board staff’s request for supplemental modeling at year 2025 to  
13 evaluate an operational scenario providing higher Delta outflows than  
14 Alternative 4A. (Exhibit SWRCB-3.) This included model assumptions that  
15 avoid impacts to fish and aquatic resources attributable to reductions in cold  
16 water pool storage and flow modifications under Alternative 8 and other  
17 higher outflow scenarios analyzed in the BDCP Draft EIR/EIS. Importantly, it  
18 is noted that:

19  
20 This evaluation was conducted primarily to consider increases in  
21 outflow, without consideration of water supply benefits, and as such,  
22 an alternative that included this operational scenario would likely not  
23 meet the project objectives or purpose and need statement. In order to  
24 provide Delta outflow similar to what was included in Alternative 8  
25 without impacting instream flows and storage, additional Delta outflows  
26 (beyond those presented for Alternative 4 in the BDCP Draft EIR/EIS  
27 or Alternative 4A in this RDEIR/SDEIS) were achieved by reducing  
28 SWP and CVP exports.

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25 <sup>11</sup> The “high-outflow scenario is similar to the scenario that was developed in response to the State Water  
26 Board’s April 19, 2011 letter to Mr. Gerald Meral and subsequent discussions with State Board staff. That  
27 letter provided suggestions for an alternative that would “establish one side of a reasonable range of  
28 alternatives.” (Exhibit DWR-113 attached is a true and correct copy of the document.) DWR continues to  
work with State Water Board staff to refine this scenario.

- 1           • An “existing outflow” scenario that nearly resembles existing regulatory  
2           conditions. This is included as Alternative 1 in the 2013 DEIR/EIS.

3           The inclusion of alternative operating scenarios responds to the State Water Board’s  
4           request that the EIR/EIS evaluate a sufficiently broad range of alternatives in order for the  
5           State Water Board to consider changes to water rights.

6           In addition, a range of alternative operating criteria have been evaluated and  
7           presented in the EIR/EIS which provide an environmental analysis of these operational  
8           ranges and the boundary analysis presented here fall within the range of alternatives in the  
9           EIR/EIS. (Exhibit DWR-114.)

10           V.       SPECIFIC BOUNDARY ANALYSIS FOR PART 1

11                   A. INTRODUCTION OF OPERATIONAL CRITERIA

12           Operational criteria for CWF will include existing regulatory requirements and new  
13           criteria associated with new and existing SWP/CVP facilities and the new permitting  
14           requirements required under the BiOp. The boundaries described in my testimony analyze  
15           possible adjustments that may be made to initial CWF operational criteria through the  
16           adaptive management framework. Each boundary is described below.

17           Existing regulatory requirements that will not change include:

- 18           • Terms imposed through D-1641 (assigning responsibility for WQCP  
19           objectives)
- 20                   ▪ Water Quality Objectives
  - 21                   ▪ Outflow Objectives
  - 22                   ▪ Delta Cross Channel Gate Operations
  - 23                   ▪ Suisun Marsh Salinity Control Gate Operations
  - 24                   ▪ E/I ratio
  - 25                   ▪ Rio Vista Minimum Flow Objectives
- 26           • Terms in BiOps and State CESA Permits
- 27                   ▪ San Joaquin River Inflow/Export (I/E) ratio
- 28

- 1           ▪ OMR flows
- 2           ▪ Fall X2 flow
- 3           ▪ Additional Delta Cross Channel Gate Operations
- 4           ▪ HORB and agricultural rock barriers operations

5 New or additional added parameters associated with the CWF facilities and potential  
6 additional regulatory requirements include:

- 7           • North Delta Diversion (NDD) Bypass Flows
- 8           • Potential Additional Old and Middle River Flows
- 9           • Potential Additional Rio Vista minimum flow
- 10          • Potential Spring Delta Outflow
- 11          • Potential Additional Operation and operational criteria for the HORG (replaces  
12           rock barrier)

13           The new or additional parameters outlined above, were developed for the BDCP  
14 (habitat conservation plan under ESA Section 10 and State Natural Community  
15 Conservation Planning Act (NCCPA)) and were carried forward into the draft biological  
16 assessment.

17           B.     BOUNDARY 1

18           Boundary 1/Existing Outflow, represents an operational scenario with most of the  
19 existing regulatory constraints, Alternative 4A criteria presented in the RDEIR/SDEIS  
20 (Chapter 4, Table 4.1-2), but does not include additional spring Delta outflow, additional  
21 OMR flows, existing I/E ratio, and the existing Fall X2 flow requirement imposed in the  
22 existing BiOp for Delta Smelt. (Exhibit SWRCB-3.) The purpose of Boundary 1 is to  
23 demonstrate a scenario similar to existing conditions with the CWF in place. Fall X2 is an  
24 area of active investigation in a multi-agency collaborative group, and its future  
25 implementation might be adjusted based on the outcome of those investigations so this  
26 scenario excluded it from Boundary 1. (Exhibit DWR-116<sup>12</sup>.)

27 \_\_\_\_\_  
28 <sup>12</sup> Exhibit DWR-116 is a true and correct copy of the document.

1 C. BOUNDARY 2

2 Boundary 2/High Outflow, represents an operational scenario with significant  
3 increase in outflows and is similar to the scenario presented in Appendix C of the  
4 RDEIR/SDEIS, which was developed in coordination with State Water Board staff. This  
5 scenario is based on the Alternative 4A H3 scenario but includes additional OMR flow  
6 requirements, additional Delta outflow, and water quality compliance at Emmaton and  
7 excludes BDCP Conservation Measure 4 (65,000 acres of tidal wetlands restoration). The  
8 purpose of this boundary is to demonstrate a scenario that has more restrictive Delta  
9 biological regulatory requirements. (Exhibit DWR-116.)

10 VI. ADDITIONAL CWF COMPONENTS

11 A. REAL TIME OPERATIONS

12 As will be discussed in Mr. Leahigh's testimony, real time operations are integral to  
13 existing operations and his testimony provides detail on how real-time operations are used  
14 to manage operations with respect to water quality by responding to monitoring and  
15 changes in observed conditions. As part of the project, real time operations for the CWF  
16 and Delta facilities will be continued as a component of the CWF operating criteria. Real  
17 time operations are meant to allow for relatively immediate responses to observed  
18 conditions to where operational adjustment maintain water quality and endangered species  
19 protections while maximizing water supply benefits. The CWF proposes continuing real  
20 time operations team.

21 B. COLLABORATIVE SCIENCE AND ADAPTIVE MANAGEMENT

22 CWF proposes a robust program for collaborative science and adaptive management.  
23 (Exhibit SWRCB-3, pp ES 37-39; SWRCB-5, Chapter 3.) The program anticipates  
24 coordination among DWR, Reclamation, USFWS, NMFS, DFW, as well as the State Water  
25 Board and public water agencies, as appropriate. The collaborative science and adaptive  
26 management program includes a process for scientific investigations through monitoring  
27 and studies to determine the effectiveness and necessity for the initial operational criteria  
28

1 that will be imposed as part of the ESA and CESA permitting for the project. These  
2 investigations may lead to changes in the initial operating criteria prior to CWF becoming  
3 operational, or at any time after operations commence. Collaborative science and adaptive  
4 management will support the CWF by helping to address scientific uncertainty, where it  
5 exists, and as it relates to understanding the benefits and effects of the construction and  
6 operations of the new water conveyance facility operations on species in conjunction with  
7 existing SWP/CVP Delta facilities. Specifically, collaborative science and adaptive  
8 management will, as appropriate, develop and use new information and insight gained  
9 during the course of construction and operation of the CWF, and to inform and improve the  
10 following aspects of the program. Collaborative science and adaptive management will  
11 focus on:

- 12 • Operation of SWP/CVP facilities within the Delta under:
  - 13 ○ existing BiOps and section 2081(b) permit; and
  - 14 ○ new BiOp and 2081(b) permit for CWF
- 15 • Design of fish facilities, including the intake fish screens; and
- 16 • Habitat restoration and non-operational mitigation relative to in-Delta SWP/CVP  
17 operations under:
  - 18 ○ existing BiOps and section 2081(b) permit; and
  - 19 ○ new BiOp and 2081(b) permit for CWF.

20 In summary, the collaborative science and adaptive management program's broad  
21 purposes include the ability to: (1) undertake collaborative science, (2) guide the  
22 development and implementation of scientific investigations and monitoring for both permit  
23 compliance and adaptive management, and (3) apply new information and insights to  
24 management decisions and actions. Through the adaptive management program, a  
25 determination will be made regarding the effectiveness and necessity of the operational  
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1 criteria based on the best scientific and commercial data available at the time the CWF  
2 becomes operational. (Exhibit DWR-117.<sup>13</sup>)

3 The program will provide guidance and recommendations on relevant science with  
4 respect to SWP/CVP operations within the Delta to inform implementation of the existing  
5 BiOps for the coordinated operations of the SWP/CVP, as well as for the new BiOp and  
6 2081(b) permit for the CWF. The collaborative science effort will build on the progress  
7 being made by the existing Collaborative Science and Adaptive Management Program  
8 (CSAMP) that was established to make recommendations on the science needed to inform  
9 implementation of or potential changes to the existing BiOps for the SWP/CVP operations,  
10 and propose alternative management actions. The regulatory agencies would determine  
11 whether and how to act on the information within the regulatory contexts of the BiOps,  
12 2081(b) permit, and other relevant authorizations (e.g., USACE permits, State Board  
13 authorizations). If new science suggests that operational changes are appropriate and  
14 those operations fall outside of the operations evaluated in the BiOp and authorized by the  
15 2081(b) permit issued for CWF, the appropriate agencies will determine, within their  
16 respective authorities, whether those changes should be implemented. An analysis of the  
17 biological effects of any such changes will be conducted to determine if those effects fall  
18 within the range of effects analyzed and authorized under the CWF BiOp, 2081(b) permit,  
19 and EIR/EIS. If NMFS, USFWS, and/or CDFW determine that the effects of the action to  
20 listed species are not previously considered and authorized under the BiOp and 2081(b)  
21 permit, Reclamation may need to reinitiate consultation and/or the DWR and/or may need  
22 to seek a 2081(b) permit amendment.

23 The collaborative science and adaptive management process will also inform the  
24 design and construction of the fish screens on the new intakes. This requires active study  
25 to ensure flexibility in their design and operation and minimize effects to listed species, as  
26 will be further discussed in part 2. Additionally, the final design of the screens will be

27 <sup>13</sup> Exhibit DWR-117 is a true and correct copy of the document.  
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1 informed by the fish agencies. The collaborative science and adaptive management  
2 process will similarly inform habitat restoration and other mitigation measures required by  
3 the existing and new BiOp and 2081(b) permit.

4 Executed on this 31 day of May, 2016 in Sacramento, California.

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7 Jennifer Pierre

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