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

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

**REVISED TESTIMONY OF TIM
STROSHANE**

1 I, Tim Stroshane, policy analyst with Restore the Delta (RTD), do hereby declare:

2 **INTRODUCTION**

3 1. I am self-employed working as a consulting Policy Analyst with Restore the Delta. I
4 received a Bachelor's degree in Environmental Studies from the University of California, Santa Cruz
5 in 1981. My senior thesis addressed political and ecological issues associated with the proposed the
6 Peripheral Canal. After completing a Master's degree in City Planning from the University of
7 California, Berkeley in 1987, I worked with consulting firms in San Francisco and Berkeley,
8 performing economic, fiscal, financial, and land use studies and contributing to environmental
9 impact reports. I started in 1993 with the City of Berkeley, where I completed numerous complex
10 assignments in housing planning, finance, policy, and economics, and homeless services and policy.
11 Between 1998 and 2004, I wrote free-lance articles and published an online newsletter on California
12 water issues. During this time, I began reading everything I could about California water law and
13 history, including the law of water rights. Since 2008, I have consulted with the California Water
14 Impact Network, Environmental Water Caucus, and, most recently, RTD.

15 2. I further declare that I provided research and drafting assistance to Restore the Delta
16 witnesses Michael Machado, Barbara Barrigan-Parrilla, and Esperanza Vielma for their testimony
17 and presentations.

18 **SUMMARY**

19 3. In my testimony as part of Restore the Delta's case-in-chief, and in support of Restore
20 the Delta's Protest to the Petition before the Board, I present evidence that shows how the new
21 diversion facilities proposed in the Petition (which I will refer to as "Petition Facilities") fail to
22 reduce reliance on the Delta for California's future water needs despite state Water Code Section
23 85021's requirement of such a reduction.

24 4. In this testimony, I also present and discuss evidence addressing the following issue
25 prompts for Part 1 of the evidentiary hearing from the Notice of Petition and Public Hearing, dated
26 October 30, 2015, concerning the petition to change points of diversion to support the California
27 WaterFix project:

- 1 1. Will the changes proposed in the Petition in effect initiate a new water right?
- 2 2. Will the proposed changes cause injury to any municipal, industrial or agricultural
- 3 uses of water, including associated legal users of water?
- 4 a. Will the proposed changes in points of diversion alter water flows in a manner
- 5 that causes injury to municipal, industrial, or agricultural uses of water?
- 6 b. Will the proposed changes in points of diversion alter water quality in a
- 7 manner that causes injury to municipal, industrial, or agricultural uses of
- 8 water?
- 9 c. If so, what specific conditions, if any, should the State Water Board include in
- 10 any approval of the Petition to avoid injury to these uses?

11 **~~THE PETITION'S PURPOSE IS CONTRARY TO STATEWIDE POLICY~~**
12 **~~MANDATING REDUCED RELIANCE ON THE DELTA FOR CALIFORNIA'S~~**
13 **~~FUTURE WATER NEEDS.~~**

14 5. ~~It is my understanding that the Delta Reform Act of 2009 (the Act) mandates that:~~
15 ~~"The policy of the State of California is to reduce reliance on the Delta in meeting California's~~
16 ~~future water supply needs through a statewide strategy of investing in improved regional supplies,~~
17 ~~conservation, and water use efficiency." (C.W.C. Sec. 85021.)~~

18 6. ~~This section of my testimony provides evidence that both the Bay Delta Conservation~~
19 ~~Plan (BDCP) and California WaterFix documents failed to analyze the project's compliance with~~
20 ~~this policy. In addition, we present evidence that the purpose of the California WaterFix project is~~
21 ~~intended to maintain present export levels of Delta water to meet California's future water needs~~
22 ~~and, with adjusted operational modeling assumptions, even increase total exports, contrary to the~~
23 ~~state's Delta policy.~~

24 7. ~~Petition Facilities' environmental documents provide no analysis of compliance with~~
25 ~~this section of the Act. The BDCP contained no mention and therefore no policy analysis of whether~~
26 ~~the proposed Conservation Measure 1 facilities complied with Water Code Section 85021.~~
27 ~~(SWRCB-5, search of "85021" yielded no results.) The BDCP Draft Environmental Impact~~
28 ~~Report/Statement mentions Water Code Section 85021 and its statement of reduced Delta reliance~~
~~but provides no analysis of compliance of the proposed project with this section of the Act.~~
~~(SWRCB 4, Appendix 1C, p. 1C.3 18; Appendix 3A, p. 3A 20 to 22, p. 3A 68, and p. 3A 149,~~
~~Table 3A 15; and Appendix 3D, pp. 3D 68 to 69.) The California WaterFix Recirculated Draft~~

1 Environmental Impact Report/Supplemental Draft Environmental Impact Statement similarly
2 mentions Water Code Section 85021 once but provides no analysis of the proposed project's
3 compliance with this section of the Act. (SWRCB 3, Appendix 3D, p. 3D 57.)

4 8.—— Petition Facilities' environmental documents state as among the project's purposes a
5 clear intent to maintain present export levels into the future and increase the reliability of delivery to
6 contractors from those exports:

7 Restore and protect the ability of the SWP [State Water Project] and CVP [Central
8 Valley Project] to deliver up to full contract amounts, when hydrologic conditions
9 result in the availability of sufficient water, consistent with the requirements of State
and federal law and the terms and conditions of water delivery contracts and other
existing applicable agreements.

10 (SWRCB 4, Chapter 2, p. 2 3:21 24 and p. 2 4:29 33; SWRCB 3, Chapter 1, p. 1 8:34 37 and p. 1
11 9:33 37.)

12 9.—— Petition Facilities' environmental documents disclose modeling results indicating that
13 preferred scenarios will not result in significant change to long term average SWP and CVP
14 deliveries. Deliveries for Alternative 4, Scenarios H3 and H4 of Conservation Measure 1 would
15 range between 4,019 thousand acre feet (TAF) and 4,497 TAF, as compared with existing conditions
16 of about 4,658 TAF, and no action alternative scenarios (future conditions without Petition
17 Facilities) of between 4,043 to 4,305 TAF. (SWRCB 4, p. 7 53, Table 7 7; SWRCB 3, p. 4.3.3 7,
18 Table 4.3.3 1.) Alternative 4A (the Petition Facilities) is estimated to result in long term average
19 deliveries of between 4,273 to 4,776 TAF. This alternative's range of deliveries includes existing
20 average deliveries and is higher than the range of deliveries anticipated for BDCP's Alternative 4
21 scenarios. (SWRCB 4, p. 7 53, Table 7 7; SWRCB 3, p. 4.3.3 7, Table 4.3.3 1.)

22 10.—— It is my understanding too that an independent modeling report provided to various
23 upstream and Delta water users¹ by MBK Engineers and Daniel Steiner (MBK/Steiner) found that
24 BDCP modeling results showed total exports increasing by 540 thousand acre feet (TAF) over a No
25 Action Alternative base of 4.73 million acre feet (MAF). (RTD 143, Attachment 1, p. 72.)

26 _____
27 ¹ The entities funding this report were Contra Costa Water District, East Bay Municipal Utilities
28 District, Friant Water Authority, Northern California Water Association, North Delta Water Agency,
San Joaquin River Exchange Contractors Water Authority, San Joaquin Tributaries Authority, and
Tehama Colusa Canal Authority.

1 However, this report argued that several adjustments to operational assumptions were necessary to
2 ensure that CalSIM II modeling results were more representative of how the CVP and SWP systems
3 would be operated with incorporation of Petition Facilities, including changes approved by DWR
4 and Reclamation for the 2013 baseline applied in the SWP Delivery Reliability Report and in this
5 report. (RTD 143, Attachment 1, p. 44-45.) Other changes were made to establish a meaningful and
6 reasonable “Future No Action Alternative” that included several additional revisions to CalSIM II
7 assumptions in the 2013 baseline. (RTD 143, p. 45.) Changes were also made to North Delta
8 Diversion Bypass Flow Criteria (RTD 143, p. 48) and to Delta Cross Channel Gate Reoperation in
9 October. (RTD 143, p. 49.) These changes were intended to make CalSIM II modeling more
10 closely approximate actual operations based on research by MBK/Steiner into known operator
11 behavior. (RTD 143, p. 44.) The independent modeling results showed that combined exports
12 would average 5.61 MAF annually for a “Future No Action” (FNA) alternative, indicating an
13 increase in exports for Alternative 4 of about 750 TAF. (RTD 143, p. 72.) This represents an
14 increase in exports with the Petition Facilities, with more apparently realistic operational
15 assumptions built into their modeling, averaging about 200 TAF annually. (RTD 143, p. 72.)

16 11. — It is also my understanding that Petition Facilities would increase the capacity for and
17 occurrence of cross-Delta water transfers, which would continue, rather than reduce, reliance on the
18 Delta for California water contractors’ future water supply needs. Compared to present conditions,
19 Petition Facilities would provide additional capacity to move transfer water from upstream sources
20 across the Delta to export service areas. They would also provide a longer transfer window of time
21 than is allowed under current biological opinion and water quality restrictions. (SWRCB-3, p. 4.3.1-
22 9, lines 19-23.) Petition environmental documents also state:

23 As a result of avoiding those restrictions, transfer water could be moved at any time
24 of the year that capacity exists in the combined cross-Delta channels, the new cross-
25 Delta facility, and the export pumps, depending on operational and regulatory
constraints, including criteria guiding the operation of water conveyance facilities
under Alternative 4A.

26 (SWRCB-3, p. 4.3.1-9, lines 23-26.)

27 Identical language is provided for the Petition Facilities’ other two RDEIR/SDEIS
28 alternatives. (SWRCB-3, p. 4.4.1-9, lines 12-19; p. 4.5.1-9, lines 12-19.) Thus, in my opinion,

1 ~~based on evidence provided here, the Petition Facilities' stated purpose of maximizing the reliability~~
2 ~~of contractual deliveries and its underlying purpose of providing additional water transfer capacity~~
3 ~~are intended to maintain, rather than reduce, reliance on the Delta for California's future water~~
4 ~~supply needs, contrary to Water Code Section 85021.~~

5 **THE PETITION IS IN EFFECT A NEW WATER RIGHT.**

6 12. The Board's Notice of Petition and Hearing contains prompts for Part 1 of the
7 hearing. (Notice of Petition and Hearing, p. 11.) This section of my testimony illustrates how the
8 changes proposed in the Petition (Petition for Change, August 25, 2015, Supplemental Information,
9 pp. 7-9; Addendum and Errata, September 11, 2015, p. 1) and in Petitioners' testimony (DWR-51,
10 pp. 8-9, 12-15; DWR-57, pp. 3-19, 23-24; DWR-61, pp. 16-19) will, in effect, initiate a new water
11 right, thereby, as I understand the application process, requiring a new water right application.

12 13. Petition Facilities are designed to isolate conveyance of fresh water from the lower
13 Sacramento River under the Delta (DWR-51), rather than convey by flow through existing Delta
14 channels to a different point of diversion. Such facilities are different in kind from the through-Delta
15 mode of conveyance described in SWP authorizing legislation, water rights permits, official
16 California water agency reports, and related documents planning for through-Delta water transfers.
17 Moreover, a project premised on isolated conveyance was voted down by the California electorate
18 on June 8, 1982.

19 14. To provide an overview, evidence provided in this section of my testimony will
20 address the Board's question whether the Petition is in effect a new water right. The essential effects
21 of the Petition Facilities are to change the method of diversion from the Sacramento River by
22 moving the points of diversion further upstream from the Delta Cross Channel and isolating water
23 diverted from those new points from the present "through-flow" method of diversion. This entirely
24 novel method of diversion is in effect a new water right. No part of the proposed method of
25 diversion is at present described or addressed by existing permits for the SWP and CVP. Nor are the
26 facilities contained in the Petition authorized by state or federal legislation.

27 15. Evidence in this section will also show that the three new diversion points differ
28 substantially from the single Hood diversion point described in existing SWP and CVP permits.

1 Existing SWP facilities are acknowledged as complete by DWR and as having put water to full
2 beneficial use by 2000. Existing CVP facilities are acknowledged as complete since 1990 and have
3 put water to full beneficial use since then. Evidence in this section also provides support for the
4 position that neither Petitioner has shown good cause to the State Water Board for time extensions
5 for their existing permits.

6 16. My testimony also provides evidence supporting an estimate of cold-stored water by
7 Petitioners. Since 2009, Petitioner Department of Water Resources has cold-stored about 8.9 million
8 acre-feet of unused appropriated water. Since 1990, Petitioner United States Bureau of Reclamation
9 has cold-stored about 25.3 million acre-feet of unused appropriated water. We will also show that
10 the Petition Facilities, as of the date my testimony was submitted, have neither fiscal appropriation
11 nor debt financing to support their construction and operation.

12 **Water Right Order 2009-0061 provides no precedent for approval of the Petition.**

13 17. Petitioner DWR provides testimony that the Petition does not change or expand the
14 quantity, timing, or source of water beyond that currently authorized in existing permits. (DWR-53,
15 p. 10.) Witness Maureen Sergent states that, in her opinion, “the limited change requested in the
16 California WaterFix (CWF) Petition for Change support[s] a determination by the State Water Board
17 that the CWF Petition, will not, in effect, initiate a new water right.” (*Id.*) Specifically she relies on
18 the Board’s Water Right Order 2009-0061 as indicative of how the Board should rule on the
19 question of whether the Petition is in effect a new water right.

20 18. It is my understanding that facts underlying the Board’s reasoning in Order 2009-
21 0061 differ from, and are inconsistent with, facts provided and relied upon by in the Petition before
22 the Board in this proceeding.

23 19. In Water Right Order 2009-0061 (Santa Cruz case), the City of Santa Cruz requested
24 to add to its water right a point of direct diversion from the San Lorenzo River near its Loch Lomond
25 reservoir to the point of diversion to storage it already had. The city’s change petition involved no
26 change of source waters; only water from the San Lorenzo River was involved. The City of Santa
27 Cruz wished to conform its direct diversion practice by filing the change petition so its direct
28

1 diversion complied with an updated water right. In matters like this, the Board saw such use of
2 change petitions as a matter of “enforcement.” (WRO 2009-0061, p. 18.)

3 20. Currently in the Delta, water passes from the Sacramento River through the Delta
4 Cross Channel, then mixes with waters of the Mokelumne River and eventually with the San Joaquin
5 River before flowing upstream into south Delta channels (due to the powerful draw of the Banks and
6 Jones pumping plants on Old and Middle Rivers). Water is rediverted at Banks and Jones pumping
7 plants for export to points south. These pumping plant rediversion points in the San Joaquin River
8 system of the Delta are over 30 miles to the southwest of where Sacramento River inflows enter the
9 Delta. In contrast to the Santa Cruz case, multiple Delta river channels and water rights are involved
10 in SWP and CVP operations in order to accomplish this through-Delta flow.

11 21. Unlike the San Lorenzo River in the Santa Cruz case, the Bay Delta Estuary is a
12 complex body of water with many sources. These sources enter as Delta inflow from the
13 Sacramento and San Joaquin Rivers, as well as numerous smaller rivers, creeks, and sloughs, and
14 tidal flow reaching Delta channels from San Francisco Bay. Each of the three north Delta diversions
15 would remove and isolate Sacramento River water from the estuary for direct conveyance to SWP
16 and CVP export pumps. (DWR-57: p. 3:27-28; 4:1-2, 6-13; 16:19-20.)

17 22. Petitioners produced modeled hydrodynamic analyses of source fingerprinting of
18 water at various locations in the Delta. These analyses identify whether water has come from the
19 Sacramento River, tidal sources, or the San Joaquin River (as well as some other sources).

20 23. Source water fingerprinting model results indicate that the composition of water
21 sources will change significantly from those presently relied on under existing water rights permits
22 for the SWP and CVP. Sacramento River water as a share of water pumped at Banks and Jones
23 pumping plants will increase significantly. At Banks presently, Sacramento River water makes up
24 nearly 60 percent of Banks water in January, steadily decreasing to 20 percent in May, rising to just
25 over 30 percent in June. With the north Delta diversions in place, Banks Pumping Plant’s
26 Sacramento River water shares are expected to increase to over 80 percent in January, 45 to 60
27 percent in May, and 45 to 55 percent in June. (RTD-130, p. 60, Figure 5; source data from SWRCB-
28

1 3, Appendix B, Section B.4.2, pp. B-209 to B-212 [Charts for No Action Alternative], B-231-234
2 [Alternative 4A, Scenario H3], and B-253-256 [Alternative 4A, Scenario H4].)

3 24. San Joaquin River water will decrease significantly as a share of water at Banks and
4 Jones pumping plants, especially in the months of January through June. Without north Delta
5 diversions, the San Joaquin River's share at the Banks pumping plant would range from 25 percent
6 in January to 65 percent in May and 50 percent in June. With the north Delta diversions in place,
7 these pumped water shares at Banks decrease to 8 to 10 percent in January to 30 to 40 percent in
8 May and June. At the Jones pumping plant, without the north Delta diversions, the San Joaquin
9 River share of pumped water averages about 55 percent of January waters, rising to 87 to 88 percent
10 in April and May before decreasing to about 52 percent in June. With the north Delta diversions,
11 San Joaquin River water at Jones would comprise around 30 percent of pumped waters, decreasing
12 in February and March to about 23 percent, rising to nearly 35 to 40 percent in April and May,
13 before decreasing to between 20 and 30 percent in June. (RTD-130, p. 60, Figure 5; source data
14 from SWRCB-3, Appendix B, Section B.4.2, pp. B-209 to B-212 [Charts for No Action Alternative],
15 B-231-234 [Alternative 4A, Scenario H3], and B-253-256 [Alternative 4A, Scenario H4].)

16 25. It is my understanding, based on this evidence, that this change to having more
17 Sacramento River water at the two pumping plants would improve water quality at the pumping
18 plants because the quality of San Joaquin River water is generally poorer than that of Sacramento
19 River water. The San Joaquin's high salt load is due partly to recirculation of present San Joaquin
20 River water exported to the San Joaquin River basin in the Delta Mendota Canal, as well as to salts
21 native to western San Joaquin Valley soils. (RTD-138, p. 34, Table 5, pp. 32-36.) In addition,
22 concentrations of a number of other pollutants are high in the San Joaquin, impairing the river's
23 water quality. (RTD-104, pp. 3-48 to 3-50, addressing salinity, nitrates, phosphates, ammonia, trace
24 metals, and pesticides.)

25 26. In contrast to the Santa Cruz case where the city wanted to bring its diversion
26 practices into compliance with its water rights permits to avoid enforcement proceedings by the
27 Board, the Petitioners do not divert any water at the proposed north Delta locations at or near this
28 time.

1 27. Finally, as noted above, Petition Facilities would increase capacity of the SWP/CVP
2 system to allow water transfers across the Delta (by routing them under, not through, Delta
3 channels). No such market-based transfer practices across or under an estuary were among the facts
4 relevant to the Santa Cruz case.

5 28. These physical facts significantly distinguish Petition Facilities from those considered
6 in the Santa Cruz case. In its Order for that case, the Board indicated to protestant Camp Pendleton
7 that it will evaluate change petitions on “a case-by-case basis in light of new insights or changed
8 circumstances...” (WRO 2009-0061, pp. 17-18.)

9 **Petition Facilities are described neither in authorizing legislation for the State Water
10 Project nor for the federal Central Valley Project.**

11 29. The Petition Facilities are not found in the enabling legislation of the SWP or CVP,
12 nor are they described in the projects’ water rights permits. For purposes of water rights licensing,
13 these two projects are now complete and have applied water to beneficial use throughout their
14 present service areas. There are no good causes for which SWRCB has reason to extend time on
15 these permits to enable further development of Central Valley and other watershed resources. It is
16 my opinion, based on evidence provided in this testimony, that the Petition’s Facilities would be a
17 new method of diverting water under the Delta, rather than through it as presently permitted, and the
18 Petition Facilities should be the subject of a new water right application.

19 30. The California Central Valley Project Act, enacted in 1933, defined no specific Delta
20 facilities. A 1959 amendment mentioned facilities for the Feather River and Sacramento-San
21 Joaquin Delta Diversion Projects. (Water Code [W.C.] Section 11260.) The amendment refers to
22 two reports produced in 1951 and 1955. The 1951 “Report on Feasibility of Feather River Project
23 and Sacramento-San Joaquin Delta Diversion Projects Proposed as Features of the California Water
24 Plan” describes only aqueduct diversions that have since become known as the South Bay Aqueduct,
25 the California Aqueduct, and the Coastal Branch. In the 1951 report, no facilities in, peripheral to,
26 nor under the Delta are described for Delta conveyance. (RTD-101, pp. 35-43.)

27 31. The 1955 report, “Financing and Constructing the Feather River Project,” describes a
28 “Delta Cross Channel” alignment that was never constructed, but its flow concepts are relevant here.

1 This facility was apparently conceived as the headworks of the Feather River Project Aqueduct. It
2 would “convey water flowing down the Sacramento River to the westerly channels of the San
3 Joaquin Delta, from which channels would flow to the intake channel to the project pumps.” It was
4 to begin on the Sacramento River just upstream of the town of Isleton and connect to Georgiana
5 Slough, which would be enlarged to its confluence with the Mokelumne River. From the
6 Mokelumne, water would flow across the San Joaquin to its Old River tributary, and Old River
7 would be dredged “to provide ample capacity for conveying water through it to the project intake
8 headworks at a point about three miles southeast of Byron.” (RTD-102, p. 4, column 2.) The
9 essential point is that the 1955 report described only through-Delta flow of waters derived from the
10 Feather River Project.

11 32. The Burns-Porter Act of 1959, approved by California voters in 1960, defined Delta-
12 related facilities of the State Water Project as including “Master levees, control structures, channel
13 improvements, and appurtenant facilities in the Sacramento-San Joaquin Delta for water
14 conservation, water supply in the Delta, transfer of water across the Delta, flood and salinity control,
15 and related functions.” (W.C. Section 12934(d)(2).) The Act contains no reference to either a
16 peripheral canal or a Tunnels-type facility with intakes in the north Delta along the Sacramento
17 River in the Legal Delta. The meaning of this description was addressed in Bulletin 76, December
18 1960:

19 One of the principal objectives of the State Water Resources Development System is
20 to conserve water in areas of surplus in the north and to transport water to areas of
21 deficiency to the south and west. The Delta is important in achieving this objective,
22 since it receives all of the surplus flows of Central Valley rivers draining to the ocean
23 during winter and spring months and is the last location where water not needed in
24 the Delta or upstream therefrom can conveniently be controlled and diverted to
beneficial use. Surplus water from the northern portion of the Central Valley and
north coastal rivers will be conveyed by the natural river system to the Delta, *where it
must be transferred through Delta channels to export pumping plants* without undue
loss or deterioration in quality. Aqueducts will convey the water from the Delta to
off-stream storage and use in areas of deficiency to the south and west.

25 (RTD-103, p. 10, emphasis added.)

26 33. Master levees, control structures, and related facilities were legislated to accomplish
27 the transfer of surplus waters provided from upstream reservoirs across and through the Delta to the
28 export pumps. Bulletin 76 offered four planning scenarios using “master levees, control structures,

1 channel improvements, and appurtenant facilities” in the Delta that would address legislative
2 purposes of water conservation, water supply in the Delta, transfer of water across the Delta, flood
3 and salinity control, and related functions. None of the facilities listed in Bulletin 76 included
4 features that would traverse the eastern periphery of the Delta, nor tunnel beneath the Delta to reach
5 the south Delta pumping plants. (RTD-103, p. 10, 29-30, 33-34, 37-38, 41-42.)

6 34. Petitioners’ witness John Bednarsky described Petition Facilities differently than
7 those called for in Bulletin 76, stating that:

8 The new SWP water conveyance facilities proposed for the CWF would introduce
9 new operational flexibility into the SWP and CVP by enabling SWP or CVP water to
10 be diverted from the Sacramento River in the north Delta and conveyed to the south
11 Delta or to be directly diverted in the south Delta at existing SWP and CVP
12 facilities.... Water would flow from the intakes through north tunnels to an
Intermediate Forebay. From there, the water would flow by the force of gravity
through two 30-mile long, 40-foot diameter main tunnels to the south Delta. A new
pumping plant would lift water into the north cell of the redesigned Clifton Court
Forebay.

13 (DWR-57, p. 3:27-28, 4:1-2, 6-10.)

14 **Petition Facilities and points of diversion are not described in existing water rights.**

15 35. State Water Project permits (summarized in Notice of Petition and Hearing, p. 9,
16 Table 1) contain lists of physical features of the system, as well as numerous permit conditions
17 governing their use and performance. (SWRCB-6, SWRCB-7, SWRCB-8, SWRCB-9.) Lists of
18 physical features in each of these permits from 1972 and 2009 refer to “Delta water facilities” as one
19 of the points of diversion. Both lists provide the same township, range, and section location that
20 includes the Delta town of Hood, site of what would have been the point of diversion for the
21 proposed peripheral canal.

22 36. Permit Condition 16 (2009 amended permits of SWRCB-6, SWRCB-7, SWRCB-8,
23 and SWRCB-9) mentions the peripheral canal by name and specifies that the Permittee (DWR) shall
24 not impair vested rights of Delta lands by constructing the canal unless it has acquired rights to do so
25 by agreement or through exercise of eminent domain.

26 37. Central Valley Project permits (summarized in Notice of Petition and Hearing, p. 10
27 Table 2) also list physical features of the project as well as permit conditions governing their use and
28 performance. The CVP permits authorize northerly diversion or rediversion within the Delta only at

1 the Delta Cross Channel, which is described as diverting project water near Walnut Grove on the
2 Sacramento River. The Delta Mendota Canal is described as “diversion point from Delta Cross
3 Channel...located on Old River.” The CVP permits’ descriptions of these two diversion points are
4 consistent across each permit and imply a continuity of flow through existing Delta channels as the
5 means by which water is transferred across the Delta under authority of Central Valley Project
6 permits. Neither a peripheral canal nor tunnel facilities are included among diversion points
7 specified in the CVP permits. (SWRCB-11 through SWRCB-20.)

8 38. Through-Delta transfer of water diverted initially at the Delta Cross Channel and later
9 at the Delta Mendota Canal has operated since 1951, when the Delta Mendota Canal went into
10 operation. The Canal was completed in 1952. (RTD-109, p. 17.) It has continued since the
11 California Aqueduct began drawing exports from the Delta in 1973.

12 39. The peripheral canal was the subject of Proposition 9, a ballot referendum submitted
13 to California voters in 1982. It was defeated by a vote of 63 to 37 percent of the electorate. (RTD-
14 139, p. 17.) The language of the ballot measure described the proposed canal as potentially being
15 constructed, operated, and financed as a joint-use facility with the United States (RTD-140, p. 37,
16 Section 11255), with an alignment “around the eastern and southern periphery of the delta”; Stage
17 One of the project would consist of “construction of the facility from the town of Hood to Shima
18 Tract...” Upon completion of Stage One, it was to be “operated for a period of two years to
19 establish fish screen and operational criteria.” (RTD-140, Section 11255(a).) This description
20 differs in its point of diversion at the town of Hood from the current Petition. The Petition’s three
21 new diversions are proposed near Clarksburg, Hood, and Courtland. None of them appear in
22 existing SWP or CVP permits. Exhibits DWR 331 and DWR-3, page 5, confirm that the three
23 proposed diversion points differ in location from the “Delta Water Facilities” diversion point in SWP
24 water rights permits. The latter diversion point is shown in Petition documents and submitted
25 exhibits at a location distinct from these proposed points. (Petition for Change, Supplemental
26 Information, August 25, 2015, “Doc No. 04-04-800-9710, Version Date 04 May 2015”; Addendum
27 and Errata, September 11, 2015, “Map 5 of 5 Delta Overview, Version Date 10 Sep 2015”; DWR-
28 331; DWR-3, p. 5.)

1 **These two projects are complete and have applied water to beneficial use throughout**
2 **their present service areas for many years since their facilities were completed.**

3 40. In its Notice of Petition, SWRCB stated the SWP had an ultimate deadline of
4 December 31, 2000, to complete construction, and of December 31, 2009, to put water to full
5 beneficial use with the completed facilities. Petition witness Maureen Sargent (DWR-53, p. 6) states
6 that DWR petitioned for time extensions for its water right permits in 2009. (DWR-313.)

7 41. The California State Water Project Atlas (SWP Atlas), June 1999, contains a
8 “timeline of development” that indicates the construction periods for initial facilities and subsequent
9 facilities of the SWP. This chart illustrates that initial facilities authorized by California voters in
10 Proposition 1 in November 1960 were all completed by 1973. DWR’s 2009 petition for time
11 extension confirms that “the initial conservation and transportation facilities were essentially
12 completed in 1973...” (RTD-118, supplemental information, p. 3, #9.) We summarize dates of
13 completion from this chart, described in SWP Atlas narratives for each facility, in RTD-116. (RTD-
14 115, p. 147; RTD-116.) “Subsequent facilities,” whose authorization has a more complex history,
15 appear from this chart and from SWP Atlas narratives to have been completed by 1997 (when the
16 Coastal Branch Phase 2 was completed). Bulletin 132-10, covering State Water Project activities for
17 2009, reports no significant construction of new facilities that would warrant extension of time on
18 water rights permits. The construction activities in the Bulletin include a variety of repairs,
19 maintenance, modification, and other activities to SWP facilities, none of which involve expansions
20 or new or altered facilities to expand application of water to more beneficial uses. These documents
21 provide substantial evidence that the State Water Project is complete for purposes of diverting,
22 storing, releasing and delivering water for beneficial use by its customers. (RTD-117, Tables 12-1
23 and 12-2.)

24 42. The CVP was described by the SWRCB in its Notice of Petition to have an ultimate
25 deadline of December 1, 1985 to complete construction, and of December 1, 1990 to put water to
26 full beneficial use by way of the completed facilities. The Bureau of Reclamation commissioned
27 histories of the Central Valley Projects. These histories report launch and completion dates for the
28 major facilities comprising each major division of the Central Valley Project ranging from 1950

1 through 1987. (RTD-114, multiple.) Often in these histories, descriptions of completion reflect the
2 ability of a conveyance facility to carry water for delivery to customers for beneficial use, or a dam
3 to safely store water for later beneficial use by customers. These histories provide substantial
4 evidence that the Central Valley Project is complete for purposes of diverting, storing, releasing and
5 delivering water for full beneficial use by its customers.

6 43. "Completion reports" are required from permittees by Water Code Section 1600 for
7 consideration by SWRCB before licensing permits. The authors of the above-mentioned histories
8 appeared to have relied on archival information for their work. Petitioners' archival files are likely
9 to contain documentation that contractors hired to construct facilities completed construction work in
10 a satisfactory manner.

11 44. The SWP reports performance of its deliveries from project operations in Bulletin 132
12 each year. It is my understanding that delivery data are evidence of having put water to beneficial
13 use. DWR itself states that its annual Bulletin 132 series reports how much water has been used by
14 the SWP. (RTD-118, p. 5.) In 2009, it reported the entire annual record of its deliveries since
15 operations began in 1962. Maximum Table A deliveries were 3.199 million acre-feet in calendar
16 year 2000. (RTD-117, p. xxxviii, Table H-1.) That same year, the SWP also delivered over 300,000
17 acre-feet of Article 21 unscheduled surplus water to municipal, industrial and agricultural customers.
18 (RTD-117, p. xxxviii, Table H-1.) DWR's 2009 time extension petition reported that maximum
19 diversion to storage at Lake Oroville was 2.488 million acre-feet in the 1977-78 water year. (RTD-
20 118, supplemental information, #5.)

21 45. The CVP reports its deliveries from project operations on its Central Valley
22 Operations web site. Between 1985 and 1990, the largest delivery of supply by the Central Valley
23 Project was 7.531 million acre-feet in 1990. (RTD-119, based on Petitioner Bureau's CVO data,
24 p. 3.)

25 46. Between 1973 and 2013, the SWP delivered on average 1.92 million acre-feet of
26 Table A supplies to its water contractors. Between 1985 and 2014, the CVP delivered an annual
27 average of 5.89 million acre-feet of project supplies to its contractors in the Sacramento Valley, the
28 Delta region, and the San Joaquin Valley.

1 47. Water Code Section 1396 requires that use of water for beneficial purposes for which
2 each project facility was constructed shall proceed with due diligence in accordance with the Water
3 Code and within the time period specified in the permits for the project. It is my opinion that the
4 exhibits cited herein from available public records support a finding that the SWP and CVP have
5 succeeded at completing their projects and putting water to full beneficial use.

6 **No good cause has been shown for SWRCB to extend time on these permits without
7 further cold-storing unused appropriated water.**

8 48. It is my understanding that water right permits are subject to the requirement that due
9 diligence must be exercised by a permittee in constructing and using their water facilities to put
10 water to full beneficial use. (Order WR 2009-0028-DWR, Point 15.)

11 49. Water Code Section 1398(a) allows the SWRCB to extend the development period of
12 water right permits for construction to be completed and to put water to full beneficial use, provided
13 the Permittees show good cause. Elsewhere, SWRCB has stated that Permittee must show good
14 cause in three ways, making a showing: (1) that due diligence has been exercised; (2) that failure to
15 comply with previous time requirements has been occasioned by obstacles which could not be
16 reasonably avoided; and (3) that satisfactory progress will be made if an extension of time is granted.
17 (Order WR 2009-0028-DWR, p. 3, see Points 15 through 20.)

18 50. As mentioned above, existing SWP permits include a “Delta Water Facilities” point
19 of diversion at Hood. DWR-331 illustrates the location of this point of diversion as distinct from the
20 three north Delta diversion points proposed in the Petition. No water has been diverted at this point
21 under the existing permits held by Petitioner DWR, nor was any water diverted at that point by the
22 deadline in the permits on December 31, 2009, since no construction of a diversion facility at that
23 point of diversion has been initiated by Petitioner. When the voters defeated the peripheral canal in
24 1982, this diversion point was included as part of that rejected project. Subsequent efforts to plan
25 and build the project eventually failed as well, as described below. Finally, we provide evidence in
26 this section of my testimony showing that the Petitioners have not demonstrated that satisfactory
27 progress would be made if a time extension were granted, or even if some form of water right
28 approval were granted by SWRCB.

1 51. Petitioners submitted petitions requesting extensions of time in 2009 for the CVP
2 (RTD-121) and SWP (RTD-118). The following testimony describes evidence of lack of diligence
3 that supports a finding of no or insufficient good cause for extensions of time for SWP and CVP
4 permits. We also note that protests of both time extension requests are still pending before the State
5 Water Resources Control Board. (Notice of Petition and Hearing, p. 9, footnote 11; p. 10, footnote
6 13.)

7 **State Water Project Time Extension Petition**

8 52. DWR submitted its most recent time extension request to SWRCB on December 31,
9 2009 for its SWP permits for the Feather River and Sacramento-San Joaquin Delta watersheds. The
10 petition sought an extension through December 31, 2015 to maximize beneficial use of water
11 through the SWP facilities. DWR argued in its time extension request that while it “*at times* diverted
12 the maximum rate allowed,” under its SWP permits, several factors have prevented DWR from
13 directly diverting, rediverting, or diverting to storage “the maximum amounts allowed *annually*”
14 under its SWP permits. These factors included hydrologic conditions in the Feather River and Delta
15 regions, regulatory restrictions on project operations, state and federal endangered species act
16 compliance requirements, increase of county of origin water usage that by law had to be supplied by
17 DWR, and the availability of alternative water supplies from “other agencies’ supplemental
18 sources.” (RTD-118, supplemental information, p. 2.) DWR also stated that passage of the Delta
19 Reform Act with its co-equal goals of habitat restoration in the Delta and increased water supply
20 reliability meant to DWR that “the implementation of the Delta Plan is likely to influence future
21 construction of SWP facilities and SWP water supply delivery,” adding that, “It is not possible at
22 this time to accurately predict what the ultimate diversions under the Feather River/Delta Permits
23 will be or a date at which the full permitted quantity will be put to beneficial use.” DWR did not list
24 or describe future SWP facilities at the time. DWR further cited the uncertainties created by the
25 above factors and concluded that

26 At the end of this period, DWR should be in a much better position to explain the
27 time, facilities, and operations that will be necessary to maximize the beneficial use
28 of water. Depending on circumstances in the future, at the conclusion of this five-
year period, DWR may need to petition for further extension of said permits.

1 (RTD-118, supplemental information, p. 2.)

2 53. In subsequent correspondence with me, DWR's attorney at the time acknowledged
3 that existing SWP facilities are complete:

4 Once DWR obtained the appropriate authorizations, including its water rights
5 permits, it diligently constructed the SWP, completing most of the major facilities by
6 the early 1970s. DWR has also been diligent in putting the water to beneficial use.
7 Since the SWP began operating, there has been a steady increase in SWP diversions
8 and deliveries, matching the increased demand in the SWP service area. It has only
9 been recently, that DWR deliveries have not continued to increase (when the water is
10 available). The leveling off (or decrease) of SWP diversions and deliveries, however,
11 is not the result of lack of facilities or demand. Instead, the steady or declining
12 diversions are the direct result of new and increased regulatory constraints.

9 (RTD-120, pp. 6-7.)

10 54. DWR's attorney further stated, "DWR does not expect an increase in historical
11 maximum diversions during the time period requested and thus there should not be changes caused
12 by approval of the time extensions." (RTD 120, p. 8.) Put another way, DWR was requesting time
13 extensions that, if granted by SWRCB, would result in little or no likelihood of achieving new
14 maximum amount of deliveries for beneficial use occurring during that ensuing six years ending
15 December 31, 2015.

16 **Central Valley Project Permits**

17 55. On June 29, 2009, USBR filed petitions requesting time extensions for all 32 of its
18 Central Valley Project permits, including the 11 permits that are part of the subject Petition here.
19 (RTD-121.) They requested additional time through 2030 to maximize full beneficial use of water
20 from their facilities. USBR acknowledged in its time extension petition that "Construction of works
21 necessary to put the full permitted quantities of water to beneficial use has been completed." (RTD-
22 121, Supplement to Petitions, p. 3, #11.) USBR further stated, however, that

23 ...it is not possible at this time to accurately predict future operations and diversion
24 levels at specific times during the extension period. Major uncertainties that include
25 possible future State Water Board actions involving additional conditions to CVP
26 permits, outcome of the Bay Delta Conservation Plan [...] process, as well as any
27 other future actions necessary for compliance with the Federal Endangered Species
28 Act, frustrate any attempt to make such predictions at this time. As a result,
Reclamation is unable to determine what the ultimate diversions under its CVP
permits will be. Reclamation will continue to put water diverted under its CVP
permits to beneficial use, including consumptive uses, as well as for environmental
and fisheries purposes. Reclamation will also continue to divert to storage in CVP
reservoirs in accordance with its permits. However, Reclamation is unable at this

1 time to provide any recommendation on permits that are ready for licensing, but may
2 do so in the future.

3 (RTD-121, Supplement to Petitions, p. 2, #5.)

4 56. It is my understanding that their water rights permits were granted by the SWRCB in
5 reliance on specific legislatively authorized facilities making up the unitary project, and, once those
6 facilities were completed and water put to beneficial use, the permits could be licensed. Petitioners
7 acknowledge that major facilities of both the SWP and CVP were completed and that water from
8 those facilities has been applied to beneficial use for many years now.

9 57. In Water Rights Order 2008-0045, SWRCB defines “cold storage” of water rights:

10 The requirement that an appropriation of water be completed within a reasonable time
11 with the exercise of due diligence is a long-standing principle of California water law
12 intended to protect the public interest by preventing “cold storage” of water rights.
13 By “cold storage” we mean a situation in which an appropriation is initiated, so that
14 the water that is subject to appropriation is not available to other parties who could
15 potentially put it to beneficial use, but the appropriator is not diligently pursuing
16 development of that water supply, so that the water remains unused, contrary to the
17 public interest.

18 (Water Rights Order Order WR 2008-0045, pp. 1-2.)

19 58. As noted, SWP and CVP time extension requests are still pending. We provide
20 evidence in this testimony of the extent of cold storage to support our contention that SWP’s and
21 CVP’s authorized and completed facilities do not warrant time extensions. The evidence we offer on
22 cold-stored water (that is, unused appropriated water) and lack of legislative and budgetary
23 authorization of the Petition Facilities supports licensing the SWP and CVP permits on one hand
24 while excluding Petition Facilities and new points of diversion from those permits on the other.

25 59. It is my understanding that cold-stored water under appropriative permits may be
26 estimated as the difference between the permits’ face amounts and the maximum deliveries from
27 permitted facilities, an estimate of unused appropriate water under the permits. As noted above,
28 SWP Table A deliveries were maximized at about 3.1 million acre-feet and have averaged about 1.9
million acre-feet in the 43 years since 1973. Face amounts reported by SWRCB for DWR’s water
rights in the Petition come to 13 million acre-feet. (RTD-129.) While the SWP is operated as a
coordinated whole, Feather River rights come to 10.4 million acre-feet of face amount and Delta
rights come to 2.67 million acre-feet. The difference between maximum deliveries and the face

1 amount of SWP permits is approximately 8.9 million acre-feet, an amount approximating unused
2 appropriated water under these permits. Since SWP's maximum deliveries occurred in 2000, and the
3 deadline for full beneficial use under the permits was 2009, and time extensions on these permits are
4 pending (and even lapsed), this estimated amount of cold-stored water has occurred for six years.

5 60. Maximum deliveries by USBR CVP facilities came to about 7.5 million acre-feet in
6 1990, and CVP deliveries during the 30 years between 1985 and 2014 averaged about 5.9 million
7 acre-feet. (RTD-119, p. 3.) Face amounts reported by SWRCB for USBR's water rights in the
8 Petition come to 32.8 million acre-feet, of which 6 million occur on the American River, 1.334
9 million on Clear Creek, 16.85 million on the Sacramento River, and 8.6 million on Trinity River.
10 (RTD-128.) The estimated difference for the CVP between face amount and maximum deliveries is
11 about 25.3 million acre-feet. This is the amount of water unused but appropriated by the Bureau of
12 Reclamation. Since maximum deliveries occurred in 1990, its deadline for putting water to full
13 beneficial use was also in 1990, and time extension petitions are pending, it is my understanding
14 based on that estimate that this amount of cold-stored water has occurred for 26 years.

15 **Failure to Obtain Authorization**

16 61. A precursor to the Petition Facilities, the Peripheral Canal as isolated conveyance
17 around the Delta, was defeated by the California electorate in June 1982, 63 to 37 percent. (RTD-
18 139, p. 17.)

19 62. Despite that rejection, a project designed to isolate conveyance of fresh water from
20 the lower Sacramento River around or under the Delta was in the planning stages by a number of
21 administrative agencies since at least 1998, beginning with the CalFED Bay-Delta Program. Failure
22 of the CalFED Bay-Delta Program and the California Bay-Delta Authority a decade ago led to
23 initiation of BDCP in 2006.

24 63. Over the next several years, the BDCP process considered several surface alignments
25 for canal conveyance around and through the Delta. Then in July 2012, the Brown Administration
26 announced a tunnels alignment in which diversions in the north Delta would be routed *under* Delta
27 lands and river channels before surfacing at Clifton Court Forebay not far from the town of Byron in
28

1 the south Delta. From there, water would be exported from the state-owned Banks pumping plant
2 and the federally-owned Jones pumping plant to south of Delta contractors of the SWP and CVP.

3 64. BDCP underwent environmental review under both the California Environmental
4 Quality Act and the National Environmental Policy Act between December 2013 and July 2014.
5 After receipt of thousands of public comments on the proposal, DWR announced in December 2014
6 a modification of the tunnels alignment and design. In spring 2015 DWR announced that it was
7 dropping all pretense of a habitat conservation plan and natural communities conservation plan
8 associated with the Tunnels project. DWR renamed the revised project “California WaterFix.” A
9 new revised draft environmental review document was released in July 2015, and public comments
10 on this proposal were submitted by October 30, 2015.

11 65. The Delta Reform Act of 2009 acknowledged that, had it been completed and
12 received regulatory approvals, the BDCP, with its Conservation Measure 1 Tunnels Project, would
13 be incorporated into the Delta Plan, subject to legislated performance criteria. (W.C. Section
14 85320.) But by April 2015, as noted, DWR and the Brown Administration removed all reference to
15 any habitat conservation plan and natural community conservation plan provisions from the tunnels
16 proposal. (DWR-51, p. 7:13-27, p. 8:1-11.) This project also has no legislative authorization. The
17 Delta Stewardship Council had previously assumed the tunnels of BDCP’s Conservation Measure 1
18 would be included in BDCP for incorporation into the Delta Plan pursuant to Water Code Section
19 85320. Instead, the Council determined in the summer of 2015 that it would have to amend the
20 Delta Plan to develop conveyance and restoration policies and that the Petition Facilities would be
21 evaluated as a covered action by the Council for its conformance with the Delta Plan. (RTD-123,
22 RTD-124, RTD-125, and RTD-126.) The project’s place in the Delta Reform Act has been
23 eliminated. The status of the Delta Plan is itself now on appeal in litigation.

1 **Failure to Obtain Financing**

2 66. The California WaterFix Project has its roots in BDCP planning begun in 2006.
3 (RTD-122.) At that time, water contractors², the DWR, the Bureau, fishery agencies³, and various
4 non-governmental organizations were among those signing on to plan BDCP. Signatories to the
5 Planning Agreement sought to plan for “covered activities” that included “conveyance elements” of
6 the SWP and CVP, as well as maintenance and facility improvements for the two projects. The
7 Planning Agreement also stated that the parties “agree they will work together to bring available
8 funding to the planning effort.” (RTD-122, p. 19, Section 8.1.)

9 67. Neither the BDCP nor the CWF has been authorized by the California State
10 Legislature or the United States Congress.⁴ The California Water Action Plan update for 2016
11 acknowledges the absence of financing for CWF, stating, “State and federal agencies will complete
12 environmental review documents, secure permits for construction and operation from state and
13 federal biological agencies, secure all necessary permits from other state and federal agencies,
14 finalize a financing plan, and complete the design of California WaterFix facilities.” (RTD-133, p.
15 9.) The 2015 Implementation report on the California Water Action Plan included only two
16 mentions of the CWF, and neither reference related to its financing or funding. No coherent funding
17 plan has been put forward by any party to the project’s planning agreements that clearly describes
18 CWF funding for planning purposes, nor how the project’s construction, operation, and maintenance
19 would be funded over the long-term. Environmental water groups have, through Public Records Act
20 and federal Freedom of Information Act requests, attempted to learn how CWF is funded.

21 68. In April 2013, DWR initiated a public negotiation process for extension of SWP
22 contracts. Contract extensions achieved through this process would be for another 50 years, through
23 the end of 2085. The initial phase of the process reached an “agreement in principle” in mid-2014

24 _____
25 ² As defined in Exhibit A of the original BDCP Planning Agreement (RTD-122), water contractors
26 included Metropolitan Water District of Southern California, Santa Clara Valley Water District
27 (SCVWD), Kern County Water Agency, Alameda County Zone 7 Water Agency, Westlands Water
28 District (WWD), and San Luis & Delta Mendota Water Authority (which as a joint powers authority
under the California Government Code includes among its members SCVWD and WWD).

³ Fishery agencies included the California Department of Fish and Game, United States Fish and
Wildlife Service, and the National Marine Fisheries Service.

⁴ Accessible at http://resources.ca.gov/california_water_action_plan/.

1 but sought delay in addressing BDCP financing until a subsequent contract amendment process
2 could be undertaken after Plumas and Butte Counties sought to include BDCP-related matters in the
3 contract extension scope, to which DWR responded “that this subject would be better addressed in a
4 separate negotiation for a BDCP/DHCCP amendment.” (RTD-134, pp. 5-6.) A separate SWP
5 contract amendments process begun in December 2014 for the proposed BDCP (now CWF) was
6 suspended in February 2015 and remains dormant.⁵ A first public negotiation meeting was held
7 December 10, 2014, but a second meeting scheduled for February 17, 2015, was postponed, with
8 DWR stating on its web site that “It will be rescheduled for a later date.” (RTD-141, PDF p. 2,
9 “Announcements.”)

10 69. Before the BDCP contract extension process was postponed, the City of Antioch, a
11 public agency that buys water from Contra Costa Water District (a Central Valley Project
12 contractor), commented that:

13 The purpose of these negotiations is to address the allocation of the costs associated
14 with the BDCP among State Water Project Contractors. This includes allocating
15 benefits such as water supply from implementation of the BDCP. This raises the
16 question of when a comparable Federal process with CVP contractors will begin.
17 How BDCP benefits will be shared between the Federal & State Projects needs to be
18 clearly identified as part of the negotiations for these Contract Amendments. The
19 public needs to understand the range of costs being assumed by its public water
20 agencies who are state contractors.

21 (RTD-135.)

22 70. The Santa Barbara County Flood Control and Water Agency also commented at that
23 time:

24 On many occasions, the District has asked that DWR address the legality of imposing
25 property taxes should the District’s financial backing be needed. To date DWR has
26 not responded to these concerns, nor has DWR given any indication that it will
27 respond, rather choose [*sic*] to ignore this issue. While through this current process,
28 that may work, it is important for DWR to understand that any amendment would
need to be approved by the District’s Board of Directors and as such this issue may
well have to be dealt with then.

If DWR desires to maintain that the District’s taxing authority is a financial guarantor
for BDCP bonds, then it seems very important that this question be answered not only
for the District but also for DWR to sell bonds presuming the taxing authority is
there.

⁵ The contract amendment website for BDCP is accessible as of August 8, 2016, at
<http://www.water.ca.gov/swpao/swpcontractamendmentforbdcp/index.cfm>.

1 (RTD-136.)

2 71. It is my understanding that these two letters bracket the major funding issues plaguing
3 CWF. On one hand, federal CVP contractors have yet to commit, nor has Congress acted to
4 authorize funding for planning, design, construction, operation, and maintenance of CWF. On the
5 other hand, neither SWP contractors nor the California Legislature have transparently authorized
6 state funds for these purposes. Planning for BDCP previously, and now CWF, has been made
7 possible, as far as the public can tell, from bonded debt issued by major water contractors (or their
8 joint powers authority coalitions) supporting the project, or by one of their joint powers authorities,
9 and through the questionable collection of property taxes under the State Water Project. Until either
10 state or federal contractors commit to funding their share of project costs, their counterpart (federal
11 or state contractors) cannot commit to funding. It is my understanding that the Joint Legislative
12 Audit Committee has assigned the California State Auditor to prepare an audit report on these
13 matters, to begin in the spring of 2017.

14 72. It is my understanding that the project's costs are high. Estimates in BDCP's 2014
15 environmental review presented the project's capitalized cost (including construction and annual
16 operating and maintenance) at about \$16,026,900,000. (SWRCB-5, Chapter 8, pp. 8-74 to 8-75,
17 Table 8-41.) This estimate did not include debt service requirements. BDCP's cost analysis
18 mentions bonds as a probable funding source, but no estimate of debt service is provided. (SWRCB-
19 5, Chapter 8, p. 8-78:11 to 8-79:16 and Table 8-43.)

20 73. State Water Project financing is structured through water service contracts between
21 DWR and each of the state water contractors. A recent DWR bond prospectus states that:

22 Generally, [DWR's] costs, including interest, of providing the facilities of the State
23 Water Project, including the Water System Projects, are payable by the Contractors
24 *whether or not water is delivered*. If a Contractor defaults under its Water Supply
25 Contract, the Department may, upon six months' notice, suspend water deliveries to
26 that Contractor. During such period, the Contractor remains obligated to make all
27 payments required by the Water Supply Contract. If a Contractor fails or is unable to
28 raise sufficient funds by other means to make Water Supply Contract payments, *the Contractor is required by the Water Supply Contract to levy a tax or assessment sufficient for such purpose....* If any affected Contractor defaults on payments under certain of [various] amendments [to account for recent construction works in the State Water Project], *the shortfall may be collected from non-defaulting affected Contractors*, subject to certain limitations.

1 (RTD-137, p. iv; emphasis added.)

2 74. — ~~These contractual requirements create obligations for each contractor to make~~
3 ~~payments to DWR. Most water contractors, if not all, have used bond financing for local supply~~
4 ~~systems they operate as well. Additional state obligations for Petition Facilities financing could~~
5 ~~weaken the ability of retail and wholesale water contractors to afford their local debt obligations~~
6 ~~under California Water Code Section 85021 to reduce their reliance on Delta sources of water~~
7 ~~through investment in “improved regional supplies, conservation, and water use efficiency.”⁶~~
8 ~~Ensuring they meet their bond obligations helps ensure they have good ratings should they wish to~~
9 ~~issue new bonds or refinance prior issues. Their ability to levy and adjust water rates (upward or~~
10 ~~downward) is critical to their ability to secure their water service contracts, which in turn provide the~~
11 ~~necessary security to DWR to meet its obligations to bond holders. (RTD-127, p. 4; RTD-133, p. 9.)~~

12 **Conclusion Concerning Good Causes for Time Extensions**

13 75. — ~~My testimony provides evidence that both the costs and the uncertainty of financing~~
14 ~~for the Petition Facilities raise serious questions regarding the ability of Petitioners and their water~~
15 ~~contractors to avoid cold storing of unused, appropriated water and to finance and construct their~~
16 ~~facilities for the purpose of putting water to full beneficial use. The facilities in existing SWP and~~
17 ~~CVP permits have all been legislatively authorized and financed and their construction completed.~~
18 ~~Using these existing SWP and CVP facilities, Petitioners have put water to as full beneficial use as~~
19 ~~they are capable. It is my opinion, based on evidence provided here, that the same level of diligence~~
20 ~~cannot be attributed to the California WaterFix Petition.~~

21 [Number the following para. 75] As demonstrated in paragraph 40 above, Petition witness
22 Maureen Sergent stated that DWR petitioned for time extensions for its water right permits in 2009.
23 (DWR-53; DWR-313.) In paragraph 55 above, I provided evidence that USBR petitioned for time
24 extensions for all of its 32 CVP water right permits, including the 11 permits that are part of the

25 ⁶ ~~Water Code Section 85021 states in full: “The policy of the State of California is to reduce reliance~~
26 ~~on the Delta in meeting California’s future water supply needs through a statewide strategy of~~
27 ~~investing in improved regional supplies, conservation, and water use efficiency. Each region that~~
28 ~~depends on water from the Delta watershed shall improve its regional self reliance for water through~~
~~investment in water use efficiency, water recycling, advanced water technologies, local and regional~~
~~water supply projects, and improved regional coordination of local and regional water supply~~
~~efforts.”~~

1 subject Petition here. (RTD-121.) In paragraph 49 above, I provide evidence that the Board applies
2 three tests to find good cause for granting time extensions: (1) whether the entity seeking the
3 extension has exercised due diligence; (2) whether failure to comply with previous time
4 requirements has been occasioned by obstacles that could not be reasonably avoided; and (3)
5 whether satisfactory progress would be made if extra time were granted. Regarding due diligence, I
6 provide estimates in my testimony of large amounts of cold-stored (that is, appropriated but unused)
7 water under both SWP and CVP permits. Regarding the failure to comply with previous time
8 requirements, I provide evidence that California voters rejected in June 1982 the Hood diversion
9 facilities for the Peripheral Canal in existing water right permits and that Petitioners have since
10 failed to develop that diversion point via the CalFED Bay-Delta Program. I also provide evidence
11 that Petitioners have failed to obtain legislative authorization and project financing and that, even if
12 time extensions were granted by the SWRCB, Petitioners are unlikely to make satisfactory progress
13 toward timely development, complete construction, and put water to beneficial use. Finally, I
14 provide evidence that, as concerns the water right permits at hand, existing SWP and CVP facilities
15 are complete and have put water to as full beneficial use as they are capable. It is my opinion, based
16 on the evidence provided in my testimony, that the same level of diligence and expectation of
17 progress can be neither attributed to nor expected from the California WaterFix Petition.

18 **PETITION FACILITIES WOULD INJURE WATER RIGHT HOLDERS AND**
19 **OTHER LEGAL USERS OF DELTA WATER BY CAUSING FLOW**
20 **ALTERATIONS THAT WOULD IMPAIR AND DEGRADE WATER QUALITY.**

21 76. The Notice of Petition and Hearing poses for Part 1 of the hearing the questions:

22 2. *Will the proposed changes cause injury to any municipal, industrial or agricultural*
23 *uses of water, including associated legal users of water?*

24 2.a. *Will the proposed changes in points of diversion alter water flows in a manner that*
25 *causes injury to municipal, industrial, or agricultural uses of water?*

26 2.b. *Will the proposed changes in points of diversion alter water quality in a manner that*
27 *causes injury to municipal, industrial, or agricultural uses of water?*

28 77. In this section of my testimony, I first address conceptual and factual issues associated with scenario proliferation and analysis in Petitioners' case in chief. From this discussion, I settle for reliance on H3 and H4 scenarios for addressing Notice questions because they provide a

1 semblance of initial operating criteria that several of Petitioners' witnesses agree describe the likely
2 operation of Petition Facilities at this time. I acknowledge the possibility that completion of the
3 Petition's biological opinion early next year may contain changes to initial operating criteria.

4 78. Restore the Delta's case-in-chief relies on assessments of various risks to
5 environmental justice communities that are best obtained from as finite a project description as
6 possible. H3 and H4 operational scenarios appear to provide that range of risks. The risks we are
7 concerned with derive from alterations to Delta flows and, through causal relationships, alterations
8 to Delta water quality due to operation of Petition Facilities. Later parts of my testimony provide
9 evidence on flow and water quality changes, including some that are alleged by other experts to be
10 artifacts of potentially questionable modeling assumptions. This evidence supports our case in
11 chief's concerns with injury and harm to Delta environmental justice communities, the largest of
12 which reside in the city of Stockton.

13 79. Restore the Delta witnesses Michael Machado, Barbara Barrigan-Parrilla, Esperanza
14 Vielma, Ixtzel Reynoso, Roger Mammon, and Xuily Lo will testify to the public interest in
15 environmental justice for a range of beneficial uses of Delta water.

16 **While Petitioners' case in chief has proliferated modeling scenarios, the scenarios that**
17 **matter to environmental justice communities are those that directly describe a**
18 **proposed project in as distinct, stable, and finite manner as possible.**

19 80. It is my understanding, based on Petitioners' case in chief and subsequent
20 correspondence from California Water Research and Pacific Coast Federation of Fisherman's
21 Associations, that answers to each of these questions will depend greatly on the trustworthiness,
22 veracity, availability, and accuracy of Petitioners' modeling results and evidentiary basis provided to
23 this proceeding. While the analysis in this section of my testimony relies upon Petitioners' and
24 others' model results, Restore the Delta notes the limitations of modeling and model results
25 identified by a Petitioner witness (DWR-71, p. 4:16-27, 13:1-4) and potentially others (Pacific Coast
26 Federation of Fishermen's Association Subpoena duces tecum, served July 8, 2016).

27 81. It is my understanding that there is a proliferation of model versions. Petitioner
28 witness Armin Munevar states:

1 In an effort to maintain consistency while developing the CWF EIR/EIS, DWR used
2 the CalSim II 2010 version throughout the multiple-year development of the Draft
3 EIR/EIS and the RDEIR/EIS. At the request of the state and federal fisheries
4 agencies, the CalSim II 2015 version was used for the draft biological assessment.
5 This same model version is also used for the presentation of evidence in support of
6 this petition.

7 (DWR-71, p. 9:19-23.)

8 82. This means that the 2010 CalSim II version was used to model effects of California
9 WaterFix in the 2015 RDEIR/SDEIS, while just a few months later a new 2015 version of CalSIM II
10 was used for the same Petition Facilities in a different document, the draft January 2016 biological
11 assessment. Mr. Munevar states:

12 A comparison between the CalSim II 2010 and CalSim II 2015 update model results
13 show similar system-wide operations and leads to similar conclusions in terms of the
14 overall changes in water supply and Delta water quality associated with CWF
15 scenarios in comparison with the NAA.

16 (DWR-71, p. 9:26-28, 10:1.)

17 83. While Petitioners disclose the altered inputs for the 2015 model version (DWR-514,
18 p. 4, Table 3), they have not provided a direct analysis of 2010 model results compared with 2015
19 for Hearing Officers and Staff and Protestants to make informed, independent comparisons.

20 84. Restore the Delta's concern is that Petitioners' alteration of modeling used for BDCP
21 and now California WaterFix may preclude reliable and stable evaluation of their claims to not cause
22 injury to legal users of water. Such unstable factual bases may not offer substantial support for
23 findings in an order on the Petition. (California Water Research letters served June 9, June 10,
24 June 15, and June 20, 2016; and PCFFA's *subpoena duces tecum* served July 8, 2016.)

25 85. If the Petitioners' modeling results submitted to date are deemed credible, then they
26 provide evidence supporting a conclusion that Petition Facilities would alter flows and water quality
27 in the Delta sufficient to cause harm to legal users of water, as well as cause water quality objective
28 violations and degradation. Testimony from other RTD witnesses will address which legal users of
water would be affected by such changes and provide descriptions of their use of and contact with
water in the Delta.

86. It is my understanding that these issues could be further complicated by Petitioners'
submission of modeling results in support of a new "boundary analysis." Petitioners' witness

1 Jennifer Pierre in her testimony described Petitioners' rationale for this boundary approach.

2 Ms. Pierre states in her written testimony:

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

18 (DWR-51, p. 10:3-16. Emphasis added.)

19 87. Elsewhere Petitioners state that "the CWF with the Initial Operational Criteria will be
20 adaptively managed in consultation with the Fisheries Agencies." (DWR-324, p. 6.) The Petition
21 states that: "As a component of the California WaterFix, an adaptive management and monitoring
22 program would be developed and implemented to use new information and insight gained during the
23 course of construction and operation of water conveyance facilities." (SWRCB-1, p. 18.) Ms.
24 Pierre's oral testimony similarly highlighted collaborative science and adaptive management as an
25 element of the Petition. (DWR-1, p. 2.) The scope of this element of the Petition includes (1)
26 operation of SWP/CVP facilities within the Delta under existing biological opinions, a section
27 2081(b) permit, and the new biological opinion and 2081(b) permit for CWF; (2) design of fish
28 facilities, including the intake fish screens; and (3) habitat restoration and non-operational mitigation
relative to in-Delta SWP/CVP operations under the existing biological opinions and section 2081(b)
permit and the new biological opinion and 2081(b) permit for CWF. (DWR-51, p. 15:12-21; DWR-
117, p. 1-2; SWRCB-3, p. 4.1-18.) Ms. Pierre further states that:

These investigations may lead to changes in the initial operating criteria prior to CWF
becoming operational, or at any time after operations commence. Collaborative
science and adaptive management will support the CWF by helping to address
scientific uncertainty, where it exists, and as it relates to understanding the benefits
and effects of the construction and operations of the new water conveyance facility
operations on species in conjunction with existing SWP/CVP Delta facilities.
Specifically, collaborative science and adaptive management will, as appropriate,

1 develop and use new information and insight gained during the course construction
2 and operation of the CWF...

3 (DWR-51, p. 15:1-3.)

4 88. It is my understanding that adaptive management, as defined in the 2009 Delta
5 Reform Act, is “a framework and flexible decision making process for ongoing knowledge
6 acquisition, monitoring, and evaluation leading to continuous improvements in management
7 planning and implementation of a project to achieve specified objectives.” (Cal. Water Code Sec.
8 85052.) Petitioners’ exhibit describing the Adaptive Management Framework for the California
9 Water Fix expands on this definition (DWR-117, pp. 2-3) and outlines current and planned efforts
10 (DWR-117, pp. 5-9), a conceptual framework for adaptive management activities (including an
11 organizational framework; DWR-117, pp. 9-15), and portions of the framework that appear to be
12 incomplete. The incomplete sections include discussions of tools and scientific support for listed
13 species and a funding plan for adaptive management. (DWR-117, pp. 15-16.) We note that adaptive
14 management does not extend to environmental justice issues. A search of DWR-117 revealed no
15 mention of the search term “environmental justice,” which is a key feature of Restore the Delta’s
16 case in chief. (RTD-152.)

17 89. Petitioners have stated that collaborative science and adaptive management are
18 important elements of the Petition and that the Petition Facilities are described by initial operating
19 criteria, which will be adjusted according to scientific results from collaborative science and
20 adaptive management processes at the stage of the Petition’s new biological opinion. Ms. Pierre
21 stated on cross-examination that the boundary framework represented in part the application of
22 adaptive management to initial operating criteria, and that it represents DWR’s recommendations for
23 a potential range of Petition permit conditions to the Board.

24 90. Petitioner witness John Leahigh states:

25 To the extent that recent drought conditions suggest future SWP/CVP operations may
26 require relaxing water quality standards to avoid exceedances, my testimony shows
27 that historical hydrology over the last several drought years are truly unprecedented.
Such extraordinary circumstances are best managed in the context of temporary
adjustments as occurred pursuant to the Water Board’s authority, as delegated to the
Executive Director, to approve temporary urgency change petitions (TUCPs).

28 (DWR-61, p. 8:3-8.)

1 91. Added to the abstract “boundary analysis” framework mentioned by Ms. Pierre,
2 Mr. Leahigh’s testimony suggests a project description for the Petition Facilities that is built on
3 shifting sands of unique waivers of water quality objectives too difficult to model.

4 92. It is also my understanding that the California Environmental Quality Act establishes
5 standards for legally sufficient environmental documents that support full disclosure of project
6 impacts and mitigations to the public and to decision-makers. Public decisions susceptible to this
7 requirement of CEQA include decisions on water rights petitions.

8 93. It is my understanding, based on my experience with CEQA, water projects, and
9 water rights, that accurate, stable, and finite project descriptions are the “sine qua non of any
10 informative and legally sufficient EIR.” (*County of Inyo v. City of Los Angeles*, 71 Cal.App.3d 185.)
11 The various ranges of modeled results put forward by the Petitioners fail to maintain, even if
12 accurate, a stable and finite project description of Petition Facilities and their “initial operating
13 criteria.” The varying operating criteria for the Boundary 1 and 2 framework, the lack of systematic
14 comparisons of modeling results between boundary analyses and H3-H4 scenarios, and the
15 RDEIR/SEIS’s Appendix C lead me to conclude that injury and harm should be assessed for
16 decision making purposes on initial operating criteria that, in an accurate, stable, and finite manner,
17 describe the Petition Facilities, as Ms. Pierre testified for Petitioners. (DWR-51.)

18 94. For this reason, I base the remainder of my testimony in this section in large measure
19 on H3 and H4 because these scenarios rely on initial operating criteria that describe the Petition
20 Facilities. It is operation of the Petition Facilities that has the potential to cause harm to legal
21 beneficial users of water in the Delta. RTD will want to revisit the initial operating criteria issue for
22 our case in chief when the biological opinion (BO) is released for Part 2 of this proceeding and new
23 initial operating criteria are put forward. The Board has expressed willingness to revisit some Part 1
24 issues in Part 2 once the new BO has come out with new initial operating criteria for the project.
25 RTD requests that new initial operating criteria should be one such issue the Hearing Officers allow
26 parties to this proceeding to revisit for Part 2 purposes.

1 **Modeling results available show several ways in which Petition Facilities would alter**
2 **flow in Delta Channels.**

3 95. Petitioners acknowledge that “there will be some changes in the streamflow regime
4 within the Delta due to the new NDD [north Delta diversions].” (DWR-324, p. 5.)

5 96. It is my understanding that there are four principal characteristics of flow alteration in
6 channels of the Legal Delta as a result of operation of Petition facilities. These include removal of
7 flow via diversion; occurrence of reverse flows; residence time of water; and the source composition
8 of Delta waters resulting from altered hydrodynamics (i.e., “source fingerprinting” model results).
9 Below, I explain from evidence how Petition Facilities will detrimentally affect flows in relation to
10 all four characteristics.

11 **Petition Facilities will remove fresh water from the Sacramento River.**

12 97. Modeling results indicate that flows in the Sacramento River downstream of the
13 Petition Facilities’ three north Delta diversions would decrease in every month on average.
14 (SWRCB-3, Figures 4.3.2-7 and 4.3.2-8; RTD-149; RTD-150; see also SWRCB-4, Figures 6-14 and
15 6-15 for analogous hydrography for BDCP.)

16 98. For the long-term monthly average changes represented in all water years, the
17 average percent change from existing conditions currently to operational effects of Alternative 4A,
18 Scenario H3 would be minus-twenty (-20) percent. This would be similar for the average percent
19 change from existing conditions to operational effects of Alternative 4A, Scenario H4 (minus
20 nineteen [-19] percent); the average percent change from the No Action Alternative (that is, future
21 conditions without the proposed Petition Facilities in operation) to Alternative 4A, Scenario H3
22 (minus twenty [-20] percent); and the average percent change from the No Action Alternative to
23 Alternative 4A, Scenario H4 (minus nineteen [-19] percent). (RTD-149, including charts, pp. 2-5.)

24 99. These alterations to flow are confirmed by modeling results for flow downstream of
25 Petition Facilities presented in Appendix B of the RDEIR/SDEIS. (SWRCB-3, Tables B.7-27
26 through B.7–30, pp. B-355 to B-362; RTD-149.) Results highlighted in red indicate modeled flow
27 results that are more than 5 percent lower than flows under the baseline flows employed in the
28 modeling. Most flow results in exhibits drawn from the California WaterFix RDEIR/SDEIS are

1 substantially reduced between the North Delta diversion facilities to Rio Vista under nearly every
2 operational scenario, every month, and nearly every water year type by the Petition facilities. RTD-
3 149 summarizes in one table and accompanying charts the mean monthly and annual flow decreases
4 the Petitioners' modeling estimates for the Sacramento River below the north Delta diversions.

5 100. Mean monthly flow decreases in the Sacramento River downstream of the north Delta
6 diversions would vary by operational scenario. The H3 operating scenario sees mean monthly flow
7 decreases ranging from -21 percent in March and June to -29 percent in August, compared to
8 existing conditions, and -21 percent (March) to -31 percent (September) compared with the future no
9 action scenario. The lowest mean monthly flow decrease is -13 percent in December, or about one-
10 eighth of baseline flow compared with existing flow conditions. (RTD-149.)

11 101. The H4 operating scenarios involved greater commitment in modeling criteria to
12 Delta outflows in spring and fall compared with H3 criteria. H4 scenarios see mean monthly flow
13 decreases exceeding -23 percent (November) in fall and summer months when Delta outflow
14 assumed commitments are lower. A fall X2 commitment results in flow decreases averaging -16
15 percent for September, still about one-sixth the flow of the Sacramento River in this reach compared
16 with existing conditions.

17 102. Independent modeling results by MBK Engineers and Daniel Steiner (MBK/Steiner)
18 examined flow alternatives between the north Delta diversions and Rio Vista and made specific
19 adjustments to model assumptions that I mentioned above in my testimony. (RTD-143,
20 Attachment 1, p. 44-49.) North Delta Diversions in this modeling effort show greater diversions
21 during July and other months because the BDCP Draft EIR/EIS modeling included artificially high
22 Sacramento River bypass flow requirements, resulting in excess Sacramento River flow into and
23 through the Delta. MBK/Steiner indicates a substantial excess of as much as 2,000 to 4,000 cfs in
24 July over the bypass requirement in 10 percent of years. (RTD-143, Attachment 1, p. 66, Figure 60,
25 comparing BDCP EIR/EIS and Independent Modeling exceedance curves.) Such excess flows
26 would exaggerate the amount of Delta outflow and through-flow that would occur, resulting in
27 reduced summer-time salinity incursion, but are not likely to reflect realistic operational treatment of
28 these flow conditions. (*Id.*) It is my understanding, based on the MBK/Steiner analysis, that this

1 likely understates the Petition Facilities' effects on salinity conditions in this reach of the
2 Sacramento River, if more efficient treatment of bypass flows is assumed.

3 103. A similar situation occurs for analysis of October flows below the North Delta
4 Diversion facility. MBK/Steiner states:

5 The most significant differences in flow changes occur in October, July, August, and
6 September. Changes in Sacramento River flow entering the Delta are a key indicator
of changes in interior Delta flows, water levels, and water quality.

7 (RTD-143, Attachment 1, p. 67.)

8 104. Another adjustment the independent modelers made to CalSIM II operational
9 assumptions affected the frequency of October surplus or excess flows at a time when the Delta is
10 frequently in balance (and flood flows are not naturally occurring). It is my understanding that
11 DWR's BDCP studies assumed that Delta Cross Channel (DCC) gates would be open for the entire
12 month of October, which would necessitate higher Sacramento River flows (and more upstream
13 reservoir releases) in order to meet the Rio Vista flow requirements than if DCC gates were closed.
14 (RTD-143, Attachment 1, p. 49; SWRCB-21, Table 3.) MBK Engineers/Steiner and Contra Costa
15 Water District (CCWD) each commented that closing DCC gates would make it possible for the
16 7,000 cfs North Delta Diversion summer bypass flow criteria to meet the weekly average flow
17 requirements for Sacramento River at Rio Vista. (RTD-143, Attachment 1, p. 49; RTD-154, pp. 14-
18 18.) MBK Engineers/Steiner stated:

19 The intent was to minimize surplus Delta outflow while meeting Delta salinity
20 standards and maintaining enough bypass flow to use the NDD facility for SOD
21 [south of Delta] exports. This is an approximation of what is likely to occur in real-
22 time operations under similar circumstances. Further gate closures may be possible
as salinity standards allow if operators decide to preserve upstream storage at the
expense of NDD diversions. This type of operation would require additional model
refinements.

23 (RTD-143, Attachment 1, p. 49.)

24 105. CCWD commented specifically on Petition Facilities modeling that "these flaws
25 remain in the RDEIR/SDEIS..." (RTD-154-p. 14.) Having analyzed these excess flows in October
26 for both the H3 and H4 operational scenarios in the early long term (as analyzed in the
27 RDEIR/SDEIS), as well as the late long term (as analyzed in the 2013 BDCP Draft EIR/EIS),
28 CCWD found that although excess October Delta outflow occurred less often in the late long-term

1 modeling results than in the early long term results, the frequency of occurrence in both early and
2 late scenarios “is also unrealistic.” (RTD-154, p. 15, Figure 3-3.) CCWD further commented that:

3 The excess Delta outflow simulated in Alternative 4/4A is due to the lack of a
4 coherent operations plan. In particular, operational requirements for the new project
5 facilities and modified operational criteria for the existing south Delta facilities were
6 specified for the operational model (CALSIM II) without recognizing that these new
7 criteria for the proposed BDCP/CWF would upset the operations of the larger water
8 supply system.

9 In this instance, the modeling projects that Water Quality Control Plan requirements
10 for flow in the Sacramento River at Rio Vista would cause releases from upstream
11 reservoirs that cannot be captured at the south Delta facilities and instead become
12 excess Delta outflow. This seldom happens in the No Action Alternative because
13 there are no OMR requirements in October under the No Action Alternative, so that
14 flow released to meet the Rio Vista requirements can be exported at the south Delta
15 facilities.

16 The project descriptions for the revised Alternative 4 and the new Alternative 4A
17 indicate [] that the south Delta facilities will be shut down for 14 days in October.
18 The 14-day shut-down requirement is modeled as a requirement for OMR to be
19 greater than –5,000 cfs for the entire month of October—even though there are no
20 OMR requirements in the project description for October. When OMR is regulated,
21 pumping at the CVP and SWP south Delta export facilities is limited. Since the
22 modeling assumes OMR is regulated for the entire month of October, the water
23 released from reservoirs to meet Rio Vista flow requirements cannot be fully captured
24 at the south Delta facilities.

25 In reality, the south Delta facilities would probably be able to capture the additional
26 flows for the 17 days during which export pumping is permitted. For the remaining
27 14 days when the south Delta export facilities are shut down, the CVP and SWP,
28 rather than increasing reservoir releases, are far more likely to limit the amount of
29 reservoir releases that flow out to the San Francisco Bay by closing the Delta Cross
30 Channel to meet Sacramento River flow requirements at Rio Vista flow requirements
31 without creating excess Delta outflow.

32 When the Delta Cross Channel gates are open, a portion of the Sacramento River
33 flow enters the central Delta, reducing flow in the Sacramento River downstream of
34 the Delta Cross Channel (Figure 3-4). To meet flow requirements in the Sacramento
35 River at Rio Vista, DWR and Reclamation have two options: (1) increase reservoir
36 releases to increase the Sacramento River flow entering the Delta, or (2) close the
37 Delta Cross Channel gates to increase the amount of flow that reaches Rio Vista
38 without increasing Sacramento River inflow.

39 The operational strategy to close the Delta Cross Channel to meet Rio Vista flows
40 without unnecessary reservoir releases has been implemented recently in November
41 of 2009 and in October of 2013 and 2014 (Reclamation, 2015). This is the realistic
42 operational strategy that should have been used in the modeling. Failure to model
43 this operational strategy, when it has in fact been implemented repeatedly in recent
44 years, biases the salinity results in the water quality impacts analysis, showing
45 reduced salinity with the project. In reality, when the Rio Vista flow requirements are
46 met by closing the Delta Cross Channel instead of by releasing flow from upstream
47 reservoirs, interior Delta salinity will increase with the project.

48 (RTD-154, p. 16.)

1 106. MBK/Steiner further analyzes flows just downstream of Hood and through both Delta
2 Cross Channel and Georgiana Slough. Their modeling for flows downstream of Hood (and therefore
3 below the North Delta Diversions) showed October flows in that area to be “about 2,000 cfs lower
4 than the BDCP modeling. The difference in this month is largely due to reoperation (closure) of the
5 cross channel gate to lessen the amount of Sacramento River flow at Hood necessary to maintain Rio
6 Vista flow requirements downstream of the cross channel gates.” (RTD-143, Attachment 1, p. 67.)

7 But the largest differences were found by MBK/Steiner in July and August:

8 The most substantial difference between the BDCP and independent modeling occurs
9 in July and August. The differences in these two months are primarily attributable to
10 model fixes that have occurred since the BDCP modeling was performed. In the
11 independent modeling, July flows are reduced on average about 7,500 cfs while
12 BDCP shows a reduction of about 3,300 cfs. In the independent modeling August
13 flows are reduced on average about 5,900 cfs while BDCP shows a reduction of about
14 3,900 cfs.

15 In the independent modeling September flows are reduced by about 6,100 cfs while
16 BDCP modeling shows a reduction of about 5,300 cfs. The independent modeling
17 shows Sacramento River flow entering the Delta to be about 7,000 cfs 50% of the
18 time, BDCP modeling show Sacramento River flow is about 8,000 cfs 50% of the
19 time.

20 (RTD-143, Attachment 1, p. 67.)

21 107. It is my understanding that flows through Delta Cross Channel and Georgiana Slough
22 account for most flows entering the central Delta from the Sacramento River. Alterations to flows in
23 the Delta Cross Channel and Georgiana Slough are further documented in detail by MBK/Steiner.
24 (RTD-143, Attachment 1, pp. 69-71.) As I understand the combined flow exceedance charts for all
25 months, flows in these two channels are definitely lower, with the MBK/Steiner flows for
26 Alternative 4 in the months of October, November, June, July, August, and about half of all
27 Septembers having the lowest path exceedance curve. (RTD-143, Attachment 1, p. 71, Figure 64.)
28 The months with the lowest flows in these two channels include October, July, and August, as stated
earlier. (*Id.*)

108. RTD-150 summarizes in one table and accompanying charts the mean monthly and
annual flow decreases the Petitioners’ modeling predicts for the Sacramento River at Rio Vista, 21
miles downstream. It is my understanding that flow decreases are also modeled further downstream
of Georgiana Slough along the mainstem Sacramento River through the Delta. Compared with the

1 future no action condition, the north Delta diversions would also result in flow decreases in the
2 Sacramento River at Rio Vista ranging from -22 percent in October to -32 percent in September.
3 Summer and fall months would all see flow decreases exceeding winter and spring decreases. All
4 months, on average, see flow decreases in this reach of the Sacramento River compared with
5 existing conditions and a future no action scenario. These modeling results were presented in
6 Petitioners' RDEIR/SDEIS in 2015.

7 109. Based on my review and analysis of Petition Facilities modeling results, mean
8 monthly fresh water flow decreases in the Sacramento River at Rio Vista occur in all months.
9 (RTD-150.) Flow decreases for H3 are lowest in wetter winter months compared with existing
10 conditions, but flow decreases grow larger in the spring, reaching -31 percent in June and -39
11 percent in August. Fall season fresh water flow decreases range from -19 percent in September to -
12 38 percent in October and -24 percent in November, compared with existing conditions. Compared
13 with the future no action scenario for H3, commitments to spring outflow limit flow decreases to less
14 than -20 percent from December through May, but the months of June through November see flow
15 decreases ranging from -20 percent in June to -46 percent (nearly half) in September. (RTD-150.)

16 110. Based on my review and analysis of flow decreases in the Sacramento River at Rio
17 Vista for H4 modeled operations, there is a pattern similar to that of H3. (RTD-150.) All months
18 see flow decreases, with December through May decreases ranging from -1 percent in April to -11
19 percent in May. June through November flow decreases at Rio Vista range from -21 percent in
20 September to -39 percent in August, compared with existing conditions. Based on my review and
21 analysis of SWRCB-3, Appendix B, H4 modeled operations reveal a similar pattern relative to the
22 future no action scenario. All mean monthly flows decrease compared with the no action scenario.
23 The range between December and May is from -1 percent (April) to -10 percent (March), and flow
24 decreases grow during June through November, ranging from -27 percent in June to -47 percent
25 (again nearly half the river's flow at Rio Vista) in September. (RTD-150.)

26 111. Not only would flows immediately downstream of the Petition Facilities be reduced
27 substantially, CWF modeling results show that flows in the Sacramento River at Rio Vista, 21 miles
28 downstream from Courtland (a town in the vicinity of the Petition Facilities' farthest-downstream

1 intake) would also be reduced substantially by Petition Facilities' operation under nearly every
2 operational scenario, every month, and nearly every water year type. (SWRCB-3, Appendix B, pp.
3 B-355 through B-362; RTD-149; RTD-150.)

4 112. These model results show that Sacramento River flow alterations from Petition
5 Facilities operation would have regional effects, since flow reductions are identified in these results
6 at specific locations 21 miles apart. Flow reductions on such a scale would injure municipal,
7 industrial, and agriculture uses in between, as well as along various distributaries near to and
8 downstream of the north Delta diversions of the Petition Facilities. As the Sacramento River enters
9 the Legal Delta from the north at Freeport, it provides flows to three distributaries: Elk Slough near
10 Clarksburg, Sutter Slough at Courtland, and Steamboat Slough just south of Courtland.

11 **Reverse flows, or “upstream transport,” would occur at times of reduced Delta inflow.**

12 113. The Sacramento River normally supplies flows to the Delta Cross Channel (when its
13 gates are open) and to Georgiana Slough just below Walnut Grove. Reduced Sacramento River flow
14 would result in less flow distributed to upstream and downstream distributaries. (SWRCB-5,
15 Chapter 5, Effects Analysis, Attachment 5C.A, Table C.A-24, p. 5C.A-119.) Reduced inflows to the
16 northern Delta would allow more tidal penetration upstream into Delta channels. At very low Delta
17 inflow from the Sacramento, north Delta diversions could result in reverse flow along the
18 Sacramento River, as far upstream as Freeport. (RTD-142, Exhibit D, pp. 29-32 [PDF pages 55-58];
19 SWRCB-5, Chapter 3, p. 3.3-143, lines 11-20.) East Bay Municipal Utilities District (EBMUD) and
20 Sacramento County Water Agency jointly operate the Freeport Regional Diversion Facility.
21 EBMUD has voiced concerns about reverse flows in the absence of habitat restoration undertaken
22 downstream. (RTD-143, Attachment 4, pp. 5-7; RTD-144, pp. 5-10.)

23 **Residence time of water would increase from operation of Petition Facilities.**

24 114. In the north, central, south, and west Delta areas, and in the Cache Slough region,
25 deprivation of 20 percent or more of mainstem Sacramento River flow would increase the residence
26 time of water relative to the no action alternative. In the north Delta, average seasonal residence
27 time of water is expected to increase from 38 to 41 days; in the west Delta, from 22 to 25 days; in
28 the eastern Delta from 36 to 45 days; in the south Delta from 16 to 25 days; and in the Cache Slough

1 region from 29 to 35 days on average. (RTD-130, Figure 4, p. 59; SWRCB-3, Table 8-60a, p. 8-82.)
2 Similar increases in residence times of water were reported in modeling results from Bay Delta
3 Conservation Plan effects analyses. (SWRCB-5, Table 5C.5.4-14, p. 5C.5.4-84.)

4 115. It is my understanding of Delta and Suisun Marsh hydrodynamics that lengthened
5 residence time of water can result in alterations to water quality such as warming water temperature;
6 increased partitioning and bioavailability of selenium from the water column, allowing it to enter
7 benthic food webs; and increased risk of harmful algal blooms releasing toxins into Delta waters.
8 Consequently, increased residence time of water can affect drinking water quality (as lack of flow
9 and slow mixing with tidal sources can increase salt concentrations); recreational beneficial uses
10 (especially water contact recreation); shellfish bioaccumulation of chemical toxins; subsistence,
11 commercial, and recreational fishing activity; and some industrial uses. Reduced mainstem flow of
12 Sacramento River water may also affect seepage to local groundwater sources, and poorer quality
13 Delta water could also affect the quality of subsurface groundwater sources of drinking water.

14 **Modeling results for Petition Facilities operation show water source fingerprinting at**
15 **various locations in the Delta will change significantly.**

16 116. My earlier discussion of source water fingerprinting model results is also relevant
17 here. From these results, it is my understanding that increases in the residence time of San Joaquin
18 River water in southern and central Delta channels will degrade water quality since the San Joaquin
19 River is known to have a worse water quality profile for salinity and other pollutant concentrations
20 than the Sacramento. (RTD-130, p. 60, Figure 5; source data from SWRCB-3, Appendix B, Section
21 B.4.2, pp. B-209 to B-212 [Charts for No Action Alternative], B-231-234 [Alternative 4A, Scenario
22 H3], and B-253-256 [Alternative 4A, Scenario H4].)

23 **Flow alterations will lead to water quality changes that will violate water quality**
24 **objectives and degrade water quality in the Delta.**

25 117. Petitioners acknowledge that “the operation of CWF has the potential to change flow
26 and water quality at some locations in the Delta...” (DWR-324, p. 6.)
27
28

1 **Reduced downstream flow and increased residence time of water and reverse flow**
2 **frequency would cause greater upstream incursion of tidal salts and influx of more**
3 **polluted San Joaquin River water.**

4 118. Petition Facilities would alter flows to such a degree that water quality would be
5 degraded to the point of injury to agricultural irrigation and drinking water uses in the Delta. From
6 my earlier testimony concerning excess flows above bypass requirements—and in relation to
7 whether modeling operations assumptions had the Delta Cross Channel closed or open during
8 October—through the Delta in October, as well as in summer months, it is my understanding that
9 flow alterations identified from modeling results (whether from Petitioners or from the MBK/Steiner
10 report) would be sufficient to alter salinity and water quality conditions in the Delta. Contra Costa
11 Water District commented on Petition Facilities' flow and water quality modeling results that:

12 The unrealistic excess Delta outflow in October freshens the modeled interior Delta
13 salinity for many months. ...[E]xcess Delta outflow in October freshens the water at
14 CCWD's Old River Intake in October and that the freshening effect is maintained
15 through December.... In contrast, during years without excess Delta outflow in
16 October, Alternative 4/4A H3 increases the salinity at CCWD's Old River Intake in
17 October, November, and December.... Further, averaging salinity over all years ...
18 underestimates the impacts that would occur.

19 (RTD-154, p. 18, Figure 3-5; RTD-143, Attachment 1, pp. 66-71.)

20 119. Modeling results in the California WaterFix RDEIR/SDEIS reveal that salinity levels
21 for Petition alternatives would increase relative to both existing conditions and the No Action
22 Alternative in the Legal Delta and Suisun Marsh, often substantially throughout most spring and
23 summer irrigation seasons in each month that the facilities operated. (RTD-130, pp. 66-67,
24 Figure 11; SWRCB-3, , Appendix B, Table EC-8A, pp. B-134 and B-135.)

25 120. At Sacramento River at Emmaton, for instance, relative to existing conditions for
26 operational scenario H3, electrical conductivity was found to increase for all years in the modeled
27 16-year period by 5 percent in March, 10 percent in April, 12 percent in May, 7 percent in June, 21
28 percent in July, 27 percent in August, and 2 percent in September (which is already a low flow/high
salinity tendency). In drought years at Emmaton, these changes in salinity increase dramatically: 14
percent in March, 18 percent in April, 36 percent in May, 23 percent in June, 49 percent in July, 42
percent in August, and 20 percent in September. (SWRCB-3, Table EC-8A, Appendix B, page B-
134.) For operational Scenario H4 at Emmaton in all years relative to existing conditions, salinity

1 increases between 5 and 9 percent during March through June, but jumps to 33 percent in July, and
2 30 percent in August. During drought years, scenario H4 salinity relative to existing conditions
3 would increase 15 percent in March, 16 percent in April, 33 percent in May, 26 percent in June, 63
4 percent in July, 47 percent in August, and 18 percent in September. (SWRCB-3, Table EC-8B,
5 Appendix B, p. B-135.)

6 121. Percentage increases in salinity occur at several other locations during the irrigation
7 season relative to existing conditions, including the San Joaquin River at Jersey Point (April and
8 May in all years, March through June and September); South Fork Mokelumne River at Terminous
9 Island (all months in all years); San Joaquin River at San Andreas Landing (March through June,
10 August through September in all years and drought years); and San Joaquin River at Prisoners Point
11 (February through June, September in all years and drought years). Interior Suisun Marsh salinity is
12 projected to degrade significantly as well. (RTD-130, p. 68, Figure 12; source data from SWRCB-3,
13 Tables EC-4 through EC-7.)

14 122. Several water quality stations are sites for regulatory compliance with salinity
15 objectives of the present Bay-Delta Estuary Water Quality Control Plan. These stations include
16 Sacramento River at Emmaton, San Joaquin River at Prisoners Point, San Joaquin River at Vernalis,
17 and the interior South Delta salinity objectives at San Joaquin River/Brandt Bridge, Old River at
18 Middle River, and Old River/Tracy Boulevard Bridge. Modeling results indicate that there would be
19 substantial increases in the number of days when exceedances of salinity objectives occur.
20 (SWRCB-3, Table EC-1, Appendix B, page B-129.) At Emmaton, the percentage of days the
21 objective is exceeded would about triple from existing conditions to operational scenarios H3 and
22 H4 for the Petition Facilities, from 6 percent to 17 percent (H3) and 18 percent (H4). The
23 percentage of total days out of compliance would more than double, from 11 percent to 26 (H3) and
24 28 percent (H4). Over the 16-year modeled period, the number of days salinity objectives were
25 violated would increase from 233 under existing conditions to 563 (H3) and 600 (H4), out of a total
26 of nearly 2,200 compliance days in the modeled period. For San Joaquin River at Prisoners Point,
27 the percentage of total non-compliance days would also more than double from 10 percent to 20
28 (H3) and 23 percent (H4) of the applicable compliance days at that station.

1 123. The modeling results of this exhibit also show either no or only small improvements
2 in salinity conditions for most of the modeled stations, especially for San Joaquin River at Vernalis
3 and the interior South Delta stations listed previously. (SWRCB-3, Table EC-1, Appendix B, page
4 B-129.) This is because removal of fresh water at the north Delta Petition Facilities would reduce
5 fresh flows passing through the Delta Cross Channel at Walnut Grove, and less good quality fresh
6 water would pass through the intervening Delta channels to the Banks and Jones Pumping Plants.
7 The water that is removed will be replaced variously, in different locations in the Delta, by either
8 tidal flow from San Francisco Bay, flow from smaller east side streams, or from San Joaquin River
9 inflow, which is higher in salinity concentration than the Sacramento River. The major water quality
10 improvements of this isolation of flows into Petition Facilities are reserved for supplies reaching
11 Banks and Jones Pumping Plants via the underground tunnel facilities described in the Petition.
12 (SWRCB-3, Fingerprinting, Section B.4.2, pp. B-191 through B-256⁷; RTD-130, Figure 5, pp. 60-
13 61.)

14 124. Additionally, water quality degradation is identified in Petitioners' environmental
15 documents for boron, bromide, chloride, nitrates, dissolved organic carbon, methyl mercury (from
16 construction and habitat restoration disturbance), harmful algal blooms, and selenium. (RTD-130,
17 pp. 63-76; source data from SWRCB-3, Appendix B: Table Bo-3, p. B-71; Table Br-1, p. B-83;
18 Table Br-5, p. B-87; Tables Cl-6 through Cl-9, pp. B-93 through B-96; Tables N-4 and N-5, p. B-
19 162; Table DOC-1, p. B-171; Tables Se-5, Se-6, and Se-7, pp. B-185 through B-186; and Tables Hg-
20 5, p. B-147, and Hg-7, p. B-149; also, SWRCB-4, Appendix 8I for methyl mercury.)

21 **Degradation of surface water quality would affect the City of Stockton's Delta Water**
22 **Supply Project intake for municipal beneficial uses.**

23 125. "Under natural conditions," stated civil engineer and Delta expert Thomas Means in
24 1928, "the boundary between salt and fresh water was Carquinez Straits. In late summer, Suisun
25 Bay became brackish, but salt water penetrated as far as Antioch only rarely and then for but a few
26 days' time." (RTD-213, p. 17.) With "no large increase of cultivated land in the delta region," the

27 ⁷ This modeling section summarizes the change in monthly composition of source waters at various
28 points in the Delta, including major public water agency diversion points including Banks and Jones
pumping plants. Compare especially Banks and Jones source composition with Contra Costa Water
District's intake at Rock Slough and Franks Tract.

1 increasingly salty waters in the Delta threatened agriculture and industry in the region. (RTD-213, p.
2 21.) Their incursion was due to upstream diversions of fresh water in the Sacramento Valley
3 reducing flow entering the Delta “to a small fraction of the flow under natural conditions.” (RTD-
4 213, p. 21.) The quality of water was found crucial to the economic, agricultural, and industrial
5 development and vitality of the San Francisco Bay estuary. Means described four relationships
6 between Delta water quality and local economic development:

7 First, [increased salinity] renders questionable the irrigation of permanent crops,
8 particularly such crops as are sensitive to salt; second, it has a tendency through the
9 percolation beneath the levees of sub-irrigating the adjoining land with saline water;
10 third, it reduces the value of lands through the fear of salinity; and fourth, it adds
11 expense and uncertainty to the question of domestic supply, for on most of the delta
12 the river is a source of domestic water.

13 (RTD-213, p.21.)

14 126. The City of Stockton draws water from the Delta for domestic and municipal use.
15 The City of Stockton obtained water right permit 21176 (Application 30531A) from the State Water
16 Resources Control Board on December 20, 2005, to divert a flow not to exceed 317 cubic feet per
17 second and 33,600 acre-feet per year from the San Joaquin River at the southwest tip of Empire
18 Tract. (RTD-225, p. 3, paragraph 5.) This permit required the City to complete its point of
19 diversion, raw water and treated water transmission pipelines, and its 30 million-gallon-per-day
20 (MGD) water treatment facility by December 31, 2015. Permit 21176 requires the City to complete
21 application of water to its authorized uses by December 31, 2020.

22 127. The City received its water supply permit (01-10-15P-001 for public water system
23 No. 3910012) on July 21, 2015 and is operating the diversion and treatment facility at this time to
24 deliver water to its north and south Stockton customers. (RTD-220, pp. 1-10.) The City’s domestic
25 water supply system diverts raw water at the Delta Water Supply Project (DWSP) under permit
26 21176 for treatment at the new Water Treatment Facility, pumps four groundwater wells in south
27 Stockton and 13 in north Stockton, and purchases treated water from Stockton East Water District
28 and raw water from Woodbridge Irrigation District. (RTD-220, p. 4, 11-12.) The City’s permit for
Delta water use constrains diversions between February 15 and June 15. During this period, the
City’s purchase contract with Woodbridge Irrigation District (WID) provides an alternative source

1 during the City's Delta curtailment period in the period March 1 through July 30. From February 15
2 through March 15, Delta water pumping and Water Treatment production may not exceed 15 MGD.
3 (RTD-220, p. 26, Section 4.2.) From March 1 through March 15, WID water may be blended with
4 Delta water or WID water used exclusively from the WID source. (*Id.*) Between March 15 and May
5 21, no Delta water may be pumped, and the raw water needs of the plant must be met exclusively
6 from the WID source. (*Id.*) From May 21 to June 15, either Delta water or WID water may be used
7 exclusively to meet the raw water needs of the plant up to its capacity of 30 MGD. From June 15 to
8 July 30, either Delta water or WID water may be used exclusively to meet raw water needs of the
9 plan up to its capacity of 30 MGD, or a blend of the two sources may be used. (*Id.*) Between July
10 30 and February 15, the Delta water diversion may be used to meet the City's raw water needs up to
11 the plant's capacity of 30 MGD. (*Id.*).

12 128. The City of Stockton started operation of DWSP in 2012. The City may take delivery
13 of up to 17,500 acre-feet per year through its purchase contract with Stockton East Water District
14 (SEWD). (RTD-218, p. 5-1.) Currently, due to drought and a reduction in SEWD's supplies, the
15 City takes much less, about 5,634 acre-feet in 2015, and expects to receive 6,000 acre-feet in 2016
16 from SEWD's reservoir supplies of Stanislaus and Tuolumne River sources. The City's urban water
17 management plan states that Stockton will use approximately 6,000 acre-feet per year from SEWD.

18 129. The City of Stockton executed an agreement with WID in 2008 to purchase up to
19 6,500 acre-feet annually. This water originates from the Mokelumne River. Stockton anticipates
20 that its WID purchases will double to 13,000 acre-feet by 2025. (RTD-218, p. 5-12, Table 5-7;
21 RTD-226, p. 1.) In all, the City of Stockton's Municipal Utilities Department water supply portfolio
22 supplied 24,843 acre-feet of water during 2015 to its 47,000 domestic, municipal, and industrial
23 customers. The City claims as its total water rights or safe yield water supplies of up to 96,480 acre-
24 feet, nearly four times its 2015 deliveries. (RTD-218, p. 5-11, Table 5-6; RTD-225.) The City of
25 Stockton projects it will increase its DWSP diversions to 50,000 acre-feet by 2035. (RTD-226, p. 1;
26 RTD-218, p. 5-12, Table 5-7.)

27 130. The City of Stockton is concerned about the future reliability of water quality at its
28 DWSP intake and potential water treatment cost increases if Petition facilities are constructed and

1 operated. The City of Stockton alleges that Petitioners have failed to use data collected near the
2 City's Delta Water Supply Project (DWSP) for impact analysis of potential harm. (RTD-221, pp.
3 38-43.) Instead, Petitioners relied on a DWR monitoring station at Buckley Cove, nearly 10 miles
4 southeast of the City's DWSP diversion point. The City stated that "Buckley Cove cannot be
5 considered representative of the water quality available at the City's intake." (RTD-221, p. 38, 39.)

6 The City informed Petitioners:

7 The City has been collecting water quality data in the stretch of the San Joaquin River
8 near its intake for over 30 years. Despite being on notice about the City's significant
9 concerns about water quality effects in the area of its intake, the BDCP proponents
10 did not obtain or use any of this data in preparing the DEIR/EIS. Moreover, DWR
11 maintains a water quality station less than one-half mile from the City's intake. It
12 was unreasonable for the DEIR/EIS to not have used data from that water quality
13 station in order to more accurately evaluate impacts to the City's drinking water
14 supply. It is not possible for the project proponents or the City to determine how the
15 BDCP will affect water quality conditions at the City's intake until a Delta
16 Simulation Model run is conducted for our intake site proximity.

17 (RTD-221, p. 38.)

18 131. Contra Costa Water District (CCWD) noticed this assumption by the Draft BDCP
19 EIR/EIS in its 2014 comments because Petitioners applied this assumption not only to Stockton's
20 intake on the San Joaquin River but to CCWD's intakes at Rock Slough, Old River, and Victoria
21 Canal. (RTD-153, p. 70.) CCWD termed this assumption "inappropriate" and "unreasonable"
22 because the actual intakes and their presumably representative locations were up to 17 miles apart.
23 (RTD-153, p. 70-71, Figure 2-1.) Moreover, CCWD chose to locate new intakes further east in the
24 Delta to escape encroaching salinity from reduced Delta inflows:

25 [I]ndeed, it is the difference in salinity at different locations in the Delta interior that
26 drove CCWD's construction of its Old River intake and Middle River intake on
27 Victoria Canal (collectively "Old and Middle River intakes"). Even intakes that are
28 relatively close together such as CCWD's Old and Middle River intakes have very
different water quality because of the complexity of the hydrodynamics in the Delta.

(RTD-153, p. 70.)

132. CCWD's 2014 comments also directly criticized the attempt to use Buckley Cove as
"representative" in water quality conditions to the location of the City of Stockton's DWSP intake,
stating that "results from modeling of the No Action Alternative, performed for BDCP Draft
EIR/EIS and provided to CCWD by DWR [citation], illustrate that salinity at the City of Stockton's

1 intake differs significantly from salinity at...Buckley Cove. The quality of water at the Buckley
2 Cove is not representative of the City of Stockton's intake." (RTD-153, p. 72, Figure 2-2.) This
3 figure shows modeled salinity differences reflecting electrical conductivity results on the order of
4 300 to 600 microsemens per centimeter for a modeled period similar to the 1975 through 1977
5 drought. (*Id.*)

6 133. It is my understanding that differences in water quality at different locations in the
7 interior Delta can often be due to differences in source water. Some locations' source water is
8 dominated by water originating from the Sacramento River, while other locations are dominated by
9 San Joaquin River water; still other locations may be dominated by Bay waters. According to source
10 water analysis obtained by CCWD from DWR, Stockton's intake often receives greater than 70
11 percent of its water from the Sacramento River, while Buckley Cove seldom receives water from the
12 Sacramento. (RTD-153, pp. 73-74, Figure 2-4.)

13 134. Concerning bromide effects, the City of Stockton alleges that Petitioners chose
14 Buckley Cove as the monitoring station for modeling changes in bromide levels representative of the
15 City's DWSP intake. (RTD-221, p. 39.) The City expressed its concern that:

16 What would the bromide concentration level increases be at the City's Delta intake?
17 The BDCP must evaluate the effects of changes in bromide levels at or near the
18 City's intake on the San Joaquin River, including effects on consumers of water and
19 on City operations. Further, if treatment plant upgrades may be necessary due to
increased levels in bromide due to the BDCP, significant environmental and
economic impacts need to be evaluated and mitigated by the BDCP, not left to the
City to address.

20 (RTD-221, p. 40.)

21 135. It is also my understanding that evaluating a high bromide or salinity, but non-
22 representative water quality site between the No Action Alternative baseline conditions and Petition
23 Facilities' operational effects would overstate concentrations of salinity and bromide at the baseline
24 and, by doing so, could in turn minimize the change in salinity or bromide concentrations resulting
25 from Petition Facilities' effects.

26 136. CCWD also commented on carcinogens. Bromide is a precursor to the formation of
27 disinfection byproducts (which include bromate, bromoform, and other brominated trihalomethanes
28 [THMs], and halo acetic acids). All of these constituents are potentially harmful to human health

1 through municipal water supplies. (RTD-153, p. 56.) CCWD commented further that neither
2 environmental review of Petition Facilities is adequate, first because tallying just the number of days
3 the bromide objective is violated fails to disclose the magnitude of the excess bromide. The
4 magnitude is directly related to the level of health risk from bromide due to its contribution to
5 carcinogen production during the water treatment process. If the bromide analysis looks only at the
6 number of days a threshold is exceeded, or percent change in concentration, it obscures the human
7 health impact of the exceedance. (RTD-153, p. 57.) This increased human health risk is discussed
8 further in RTD witness Barbara Barrigan-Parrilla’s testimony on environmental justice. (RTD-20.)

9 137. Similarly, CCWD stated that Petition Facilities’ environmental reviews obscure
10 bromide concentration impacts by limiting its identification of significant bromide impacts to those
11 at Barker Slough/North Bay Aqueduct. (RTD-153, p. 57.) No other locations were analyzed,
12 although it is possible that significant bromide impacts would occur at other drinking water intakes
13 in the Delta, such as Stockton’s.

14 138. Nitrosamines and harmful algal blooms were also identified in CCWD’s comments as
15 potential human carcinogens if found in drinking water supplies above safe thresholds. (RTD-153,
16 pp. 60-65.) In particular, CCWD commented that operation of Petition Facilities would contribute to
17 physical factors that would contribute to the type of environment in which cyanobacteria (species
18 that can make up harmful algal blooms) thrive, such as: increased nutrients (such as ammonium),
19 increased tidal mixing contributing more salinity to Delta waters, increased residence time of water,
20 and increased water clarity. (RTD-153, pp. 63-64.)

21 139. As noted in my testimony above, Petition Facilities are expected to increase residence
22 times of water in Delta channels. CCWD commented that projected increases in residence time
23 would allow cyanobacteria blooms to thrive and last longer than they now do in the Delta. This
24 would be expected particularly in the south Delta, where south Delta exports at Banks and Jones
25 pumping plants will decrease as SWP and CVP operators “would likely preferentially use” the north
26 Delta intakes, which could result in a negative feedback loop where the north Delta intakes would be
27 used more and more in the event that higher residence times in the south contribute to longer-lasting
28 harmful algal blooms, exacerbating the impact. (RTD-153, p. 64-65.)

1 140. Concerning chloride effects, the City of Stockton alleges that the Petitioners failed to
2 address impacts from chloride to its DWSP intakes, preferring in the BDCP DEIR/EIS to defer
3 impact disclosure and possible mitigation to “some later date,” which the City called unacceptable.
4 (RTD-221, p. 41.)

5 **CWF poses adverse water quality effects to groundwater supplies for municipal**
6 **beneficial uses.**

7 141. Such water quality effects in Delta channels would affect groundwater, since surface
8 and groundwater supplies in the Delta are connected. The Delta area has a large pumpage
9 depression or “cone of depression” that causes an influx of water from the Delta to percolate to
10 underground water supplies. (RTD-145, p. 167, column 2.) United States Geological Survey
11 groundwater modeling estimates that Delta surface channels lose between 100 to over 500 acre-feet
12 per year to groundwater percolation. (RTD-145., pp. 171-172, Figure C19.) Surface water was also
13 found to recharge groundwater from Calaveras and Stanislaus rivers and Dry Creek. On average
14 there was a net lateral inflow to the groundwater system of 120,000 acre-feet between 1970 and
15 1993 (an estimated annual average of about 5,000 acre-feet per year). (RTD-146, p. 69, Section
16 2.3.4.4.) Generally, groundwater pumping rates in San Joaquin County in 2004 were found to
17 exceed the sustainable yield of the groundwater basin, estimated to be approximately 150,000 to
18 160,000 acre-feet. (RTD-146, p. 69, Section 2.3.6.) The eastern San Joaquin groundwater basin
19 management plan assumed that “all basin inflow in west Stockton is saline” because “accretions in
20 the western fringes of the Basin and the Lower San Joaquin River are undesirable due to elevated
21 salinity levels. Saline groundwater intrusion has forced the closure of several wells in the Calwater
22 service area.” (RTD-146, pp.69, Section 2.3.6.) The City of Stockton’s domestic water supply
23 permit from the State Water Resources Control Board shows that Stockton has nine inactive wells
24 and has destroyed another 17 wells. (RTD-220, pp. 13-14.) Increased west-to-east flow is
25 considered by San Joaquin County’s groundwater basin management plan to be “undesirable,” as
26 this water is typically higher in TDS and chloride levels and causes degradation of water quality in
27 the Basin. (RTD-146, p. 71, Section 2.3.7.) The plan further states:

28 Degradation of water quality due to TDS or chloride contamination threatens the
long-term sustainability of a very important water resource for San Joaquin County,

1 since water high in TDS and/or chloride is unusable for either urban drinking water
2 needs or for irrigating crops. Damage to the aquifer system could for all practical
3 purposes be irreversible due to saline water intrusion, withdrawal of groundwater
4 from storage, and potential subsidence and aquifer consolidation.

(RTD-146, p. 71, Section 2.3.7.)

4 142. The saline front of groundwater intrusion beneath south and downtown Stockton is
5 projected to move another 1.5 miles east by 2030, when future urban water demand is expected to
6 see a net increase among the cities of San Joaquin County of 146,600 acre-feet per year. (RTD-146.
7 p. 74, Figure 2-27, p. 75, Table 2-4; RTD-147, pp. 2-15 to 2-16, Figures 2-8 and 2-9, and p. 2-18,
8 Table 2-3.)

9 **Summary of Water Quality Degradation**

10 143. Increased groundwater percolation from Delta channels containing surface water that
11 is made more saline by operation of Petition Facilities would increase the risk that poorer DWSP
12 water quality would force Stockton and its other urban water supplier, California Water Service
13 Company, to rely more on groundwater sources to supply their customers. The potential effects of
14 this issue are taken up in more detail in Barbara Barrigan-Parrilla's and Esperanza Vielma's
15 testimony for Restore the Delta. (RTD-20 and RTD-40.)

16 144. There are many legal users of water in the north Delta, where major agricultural crops
17 include pears, vineyards, and other permanent deciduous crops which depend on good quality fresh
18 water supplies. Removal of 20 percent or more of the fresh water in this region of the agricultural
19 Delta will reduce fresh water supplies to farmers and cause injury to their water rights and crop
20 productivity when salts build up in soil horizons, which must be leached out. (RTD-148.) Available
21 salinity modeling from the RDEIR/SDEIS indicates that central Delta locations will see increased
22 salinity conditions as an effect of construction and operation of Petition Facilities. (See San Joaquin
23 River at Prisoners Point results in SWRCB-3, Tables EC-8A and 8B.) Increased salinity conditions
24 in affected parts of the Delta will mean agricultural uses will be injured by having either to accept
25 lower crop yields or shift to more salt-tolerant crops, or both. Either strategy will result in reduced
26 farm income, as Mr. Machado shows in his testimony (RTD-30), and reduced income and economic
27 activity for the Delta region as a whole. (RTD-20, RTD-40.)
28

1 **RECOMMENDATIONS**

2 **Deny the Change Petition.**

3 **The Petition violates California Water Code Section 85021, mandating reduced Delta**
4 **reliance for California’s future water needs.**

5 145. Evidence I provided herein supports a finding that the Petition Facilities, and their
6 currently known operating assumptions, would run contrary to Water Code Section 85021. The
7 Petition’s stated purpose is to maintain exports from the Delta for both contractual amounts and to
8 use a strategy to increase the capacity and occurrence of cross-Delta water market transfers.
9 Modeling results for BDCP Conservation Measure 1 and California WaterFix alternatives bear out
10 these purposes and strategies.

11 **Should the Board seek to consider the Petition, we recommend requiring a new**
12 **Petition, appropriately designated as a Petition for a new water right.**

13 146. Because operation of the Petition Facilities would in effect create a new water right,
14 the changes proposed in the Petition should require filing an application for a new water right by the
15 Permittees, which would have a more junior priority date. RTD respectfully urges the SWRCB to
16 suspend consideration of the Petition while it completes other higher priority tasks.

17 **Other Recommended Actions.**

18 147. The Notice of Petition and Hearing asks Part 1 parties: “What specific conditions, if
19 any, should the State Water Board include in any approval of the Petition to avoid injury to these
20 uses?” (Notice of Petition and Hearing, October 30, 2015, p. 11.)

21 **Because the projects now permitted are completed and have put water to as full**
22 **beneficial use as they are capable, we recommend that these existing permits be**
23 **licensed, excluding Petition Facilities.**

24 148. SWRCB should process licenses for the existing SWP and CVP permits and thereby
25 resolve the outstanding time extension requests that so many protested back in 2009 and 2010. The
26 California WaterFix project described in the subject Petition should be excluded from these licenses
27 since it is a new project.
28

1 **If the California WaterFix Project is filed with the State Water Board as a new water**
2 **right application, we recommend the following:**

3 149. This project’s application priority should reflect the date is officially filed and
4 determined to be complete by staff of the Division of Water Rights of the State Water Board.

5 150. If Petitioners file an application for a new water right for the California WaterFix
6 facilities, that application should be subject to water availability analysis in light of new flow criteria
7 and other water quality objectives for the Delta, updated findings on water availability in Central
8 Valley streams as part of the updated fully-appropriated streams order, and any new information
9 about the proposed facilities itself from both Petitioners, including the environmental documents
10 produced as part of the application.

11 151. An analysis I presented on behalf of California Water Impact Network, California
12 Sportfishing Protection Alliance, and AquAlliance to SWRCB in October (written) and November
13 2012 (oral) approximates part of what RTD thinks SWRCB must undertake. (RTD-131.) That
14 analysis employs flow criteria for Delta inflow and outflow based on SWRCB Delta flow criteria
15 (SWRCB-25), together with an inventory of major water right holders (i.e., those whose water right
16 claims have a combined face value exceeding 1,000 acre-feet). Those criteria called for 75 percent
17 of unimpaired flow on the Sacramento River between November and June, 60 percent of unimpaired
18 flow of the San Joaquin River between February and June, and 75 percent of unimpaired flow for
19 Delta outflow from January through June.

20 152. By applying those flow criteria, I established a “diversion cap” for each tributary
21 stream in the Delta’s Central Valley watershed. From Sacramento River tributaries (including the
22 Trinity, which is connected via a diversion tunnel to Clear Creek) the diversion cap was 25 percent
23 of unimpaired flows—that is, up to 25 percent of unimpaired flow could be diverted for human
24 beneficial use; the rest of the flow (75 percent) was for instream beneficial uses. (RTD-131.)

25 153. My written analysis, in pertinent part, shows that, on the Trinity River, the USBR
26 could divert a range from 77 to 454 thousand acre-feet per year, depending on the hydrology. (RTD-
27 131, Table 3B, p. 15; and Figure 5, p. 19.) The Trinity River Record of Decision calls for a normal
28 year average of 647,000 acre-feet of unimpaired flow annually, but it has not yet been implemented

1 through a water right proceeding. (RTD-132, p. 12.) On the Sacramento River, riparian and senior
2 pre-1914 appropriative water right holders dominate the available flows under that river's diversion
3 cap. USBR water rights, some of which date to 1927, would obtain no water under the diversion
4 cap, and none could be diverted to storage, while accommodating instream beneficial uses. (RTD-
5 131, Table 3B, p. 15 and Figure 6, p. 19)

6 154. On the Feather River, riparian and senior appropriators would dominate the available
7 flows under the diversion cap. DWR's 1927, 1951, and 1956 water right claims to the Feather could
8 divert between just 7 to 236 thousand acre-feet across all the spectrum of unimpaired flows on that
9 river. (RTD-131, Table 3B, p. 15; and Figure 7, p. 21.)

10 155. Finally, on the American River, riparian and senior water right holders (some whose
11 claims date back to Gold Rush days) would divert flows under the river's cap. USBR could divert
12 between 9 and 139 thousand acre-feet a year across the spectrum of unimpaired flows there. (RTD-
13 131, Table 3B, p. 15 and Figure 10, p. 22.)

14 156. At a minimum, any new water right application for the Petition Facilities must carry
15 over many conditions from DWR's and USBR's permits to ensure consistent protections for the
16 regional water rights of areas of origin and the Legal Delta. Our recommendations for conditions to
17 be applied to a Tunnels Facilities water right should include:

- 18 1) Standard permit conditions required by SWRCB, Conditions A through H.
- 19 2) An appropriate construction deadline, not to exceed 15 years (the RDEIR/SDEIS expects
20 it would take 14 years).
- 21 3) A deadline of no more than 5 years from the date of certification of construction
22 completion for full application of water diverted by the Petition's facilities to full beneficial
23 use.
- 24 4) Carry-over of all area, county, and watershed of origin condition requirements, including
25 conditions 16, 23, 24, 25, 29, and 40 (as exemplified in SWP Permits 16478, 16479, 16481,
26 and 16482, as amended in 2009). These requirements must be applied as well to any
27 SWRCB amendment of CVP water rights now and in the future.
- 28 5) Requiring that total pumped diversions from all Delta diversions covered by the water
rights permits shall result in reduced reliance on the Delta for California's future water needs
by the completion date for California WaterFix project facilities. We strongly recommend
that the Board reserve jurisdiction over this matter.

1 **Further Recommendations**

2 157. Restore the Delta recommends that the Board undertake a proceeding that develops
3 appropriate flow criteria for the Bay-Delta Estuary WQCP, that addresses the conveyance flow
4 criteria required in the Delta Reform Act of 2009, and that also results in reduced export reliance on
5 the Delta for California's future water supply needs.

6 158. Restore the Delta recommends that the Board update its fully-appropriated streams
7 order 98-08 prior to issuing permits for the California WaterFix project to reflect all water rights
8 issued by the Board since its last fully-appropriated streams order in 1998. Such an update would
9 provide a necessary baseline of appropriated waters in Central Valley and Delta streams against
10 which water availability claims by the Petitioners should be evaluated.

11 159. Restore the Delta recommends that the Board, as a responsible agency under the
12 California Environmental Quality Act, require that any new water right application for the California
13 WaterFix facilities be accompanied by another recirculated EIR/EIS that has more relevant
14 information for purposes of water rights application review than is presently provided in the 2015
15 environmental documents on the Petition Facilities.

16 Thank you for the opportunity to provide this testimony.

17
18 DATED: ~~August~~ October 12, 2016


19 TIM STROSHANE