

Identification of Water Conveyance Alternatives

3A.1 Introduction and Purpose of this Appendix

The Delta Conveyance Project Final Environmental Impact Report (EIR) is being prepared to evaluate the potential impacts of implementing the proposed Delta Conveyance Project (project), which would develop new diversion and conveyance facilities in the Sacramento–San Joaquin Delta (Delta) that are necessary to restore and protect the reliability of State Water Project (SWP) water deliveries and, potentially, Central Valley Project (CVP) water deliveries south of the Delta, consistent with the *California Water Resilience Portfolio* (California Natural Resources Agency 2020) and in a cost-effective manner.

This appendix describes the process for identifying and screening alternatives to be evaluated in the Final EIR, focusing on the project objectives, as laid out in the Notice of Preparation (NOP). These project objectives are discussed in more detail in Chapter 1, *Introduction*, and Chapter 2, *Purpose and Project Objectives*.

This appendix is limited to discussion of alternatives to be considered for detailed analysis in the Final EIR. Separate analyses have been prepared to describe the development of specific locations and design criteria of intakes and other facilities associated with various conveyance alignment alternatives (Delta Conveyance Design and Construction Authority 2022a).¹

3A.1.1 Organization of this Appendix

This appendix provides the following: (1) a brief description of the background of the development of the Delta Conveyance Project and the Final EIR; (2) descriptions of the screening criteria used to identify *potentially feasible alternatives* (a term of art under the California Environmental Quality Act [CEQA] [14 Cal. Code Regs. § 15126.6]) to be evaluated fully in the Final EIR; and (3) the results of the two filters to define the final range of alternatives to be considered in the Final EIR.

3A.2 Delta Conveyance Background

The Delta Conveyance Project is proposed in the context of the history of Delta issues as they relate to its ecosystem, SWP and CVP pumping facilities, Delta land use and water supply, and the regulatory environment. For more than 100 years, the State of California and the federal government have worked to develop a long-term water supply program to protect the beneficial uses of the San Francisco Bay and the Delta. In recent decades, priorities have involved balancing the need for SWP water supply reliability and Delta ecosystem health in a manner that addresses increasing statewide water demands, climate change stressors, and the needs of state-listed and federally listed fish and wildlife species. State and federal efforts to address these issues have

¹ Throughout this appendix, the general term *alternatives* is used to describe not only those alternative conveyance proposals that are being carried forward in the Draft EIR, but also those other proposals that, for reasons described herein, have been carefully considered, but are not being carried forward.

1 included proposals to divert water supply that moves through the Delta from alternative locations
2 or in different ways.

3 Changing the point of diversion for water exported from the Delta was first proposed as part of the
4 SWP in the early 1960s as the Peripheral Canal, which would have included a diversion located on
5 the Sacramento River near Hood, and an open canal that would have conveyed water around the
6 eastern side of the Delta, terminating at the SWP and CVP south Delta pumping plants. State
7 fisheries biologists supported such a canal as a way to eliminate the adverse environmental effects
8 of pumping water from the south Delta. Others sought a canal to help meet increased demand for
9 water supplies. Efforts to build what became known as the Peripheral Canal lasted through 1982,
10 when it was defeated in a ballot initiative.

11 The next major iteration of a water project to add additional diversion points to convey water
12 outside the confines of the Delta waterways began in 2006, when development of the *Bay Delta*
13 *Conservation Plan* (BDCP) under Section 10 of the federal Endangered Species Act (ESA) was
14 initiated. The habitat conservation plan² initially proposed Conservation Measure 1, which would
15 add five new points of diversion in the north Delta to divert up to 15,000 cubic feet per second (cfs)
16 of water from the Sacramento River and convey water supply in two tunnels under the Delta to the
17 existing SWP export facilities in the south Delta. The BDCP species conservation strategy also
18 proposed avoiding, minimizing, and mitigating for potential impacts on species through restoration
19 and enhancement of more than 165,000 acres of fish and wildlife habitat and reductions in other
20 Delta stressors during a 50-year permit term. In the Delta Reform Act, the California State
21 Legislature expressly recognized that the BDCP, including new Delta conveyance, could become a
22 major component of the Delta Plan (the state's plan for how to further the coequal goals of
23 ecosystem restoration and water supply reliability for the Delta). The original Delta Plan (2013)
24 recommended completion of the planning process and implementation of the BDCP. For additional
25 detail about the Delta Plan and the consistency process, see Appendix 3E, *Delta Reform Act*
26 *Considerations*.

27 Development of the BDCP conservation strategy involved an extensive alternatives screening
28 process for conveyance facility siting, water diversion operations, and species conservation
29 measures. The BDCP EIR/Environmental Impact Statement (EIS) analyzed 15 alternatives that were
30 selected from a three-phase alternatives screening process that considered numerous conveyance
31 facility diversion locations and approaches and conveyance alignments in the eastern, western, and
32 central Delta. The screening analysis was informed by contributions and advice from the BDCP
33 Steering Committee and other ideas gathered during an extensive public review process. In all, up to
34 20 conveyance facility site alternatives, 10 water supply diversion operation scenarios, and 8
35 alternatives and components of alternatives that did not require construction of new diversions or
36 conveyance facilities were all considered. The BDCP alternatives screening also included substantial
37 participation from agencies, including the Bureau of Reclamation, State Water Resources Control
38 Board, California Department of Fish and Wildlife (CDFW), Delta Stewardship Council, the Delta
39 Protection Commission, and other interested parties, including Congressman John Garamendi,
40 Restore the Delta, Delta water districts, and property owners over many years and through different
41 stages of the project and EIR/EIS development.

42 As a result of input on the draft BDCP regarding the availability of resources to sufficiently meet the
43 recovery standard for the proposed covered species, in 2015, the lead agencies proposed three new

² The BDCP was also proposed to meet state requirements as a Natural Community Conservation Plan.

1 sub-alternatives to the original 15 evaluated in the Draft BDCP EIR/EIS, including California
2 WaterFix, which proposed construction of water conveyance facilities similar to those proposed as
3 Conservation Measure 1 in the BDCP, but with a reduced scale, to divert up to 9,000 cfs from three
4 intakes in the north Delta, with compensatory habitat mitigation focused on reducing impacts of
5 conveyance facilities. At the same time, then-Governor Jerry Brown announced the California
6 EcoRestore program, which would restore large areas of habitat in the Delta and Suisun Marsh on an
7 independent track. The three new sub-alternatives were developed based on previous alternatives
8 screening analyses for intakes, conveyance facilities, and facility operations criteria and
9 contributions from fish and wildlife agencies and interested parties. A separate EcoRestore program
10 for Delta habitat restoration and enhancement projects has been implemented to improve
11 ecosystem conditions not directly related to a new Delta conveyance. The California WaterFix was
12 approved by the California Department of Water Resources (DWR) in 2017. Consistent with the
13 change in approach from the BDCP to an approach based on new conveyance separate from the
14 habitat restoration program in California EcoRestore, the Delta Stewardship Council adopted a new
15 recommendation in 2018 that the state implement a dual conveyance strategy with new intakes in
16 the north Delta and conveyance facilities to connect it with existing water supply infrastructure in
17 the south Delta.

18 In 2019, following a change in California's administration, Governor Gavin Newsom proposed a
19 strategy to address water supply reliability issues through a proposal for Delta conveyance at a
20 reduced scale, involving a single main tunnel. As a result, DWR withdrew approval of California
21 WaterFix to begin a new planning and environmental review effort consistent with Governor
22 Newsom's policy. Governor Newsom directed the state to prepare a water resilience portfolio and
23 asked DWR to study a single-tunnel project. The current configuration of the proposed Delta
24 Conveyance Project, as presented in this Final EIR, builds on previous efforts that have taken place
25 over the past 15 years. A summary of these efforts follows.

- 26 ● The initial conveyance configuration, the Bay Delta Conveyance Project Pipeline/Tunnel Option
27 (PTO), was documented in the March 10, 2010, *Conceptual Engineering Report* (CER) and the
28 subsequent October 2010 Addendum that described the addition of reaches of pipeline to the
29 conveyance. The original PTO was a 15,000-cfs conveyance facility that consisted of five intakes
30 on the Sacramento River between Freeport and Walnut Grove, pumping plants at each intake, an
31 intermediate pumping plant and intermediate forebay (surface water impoundment) near the
32 intakes, a new forebay near the existing SWP Clifton Court Forebay, and other appurtenant
33 facilities (California Department of Water Resources 2010a:ES-2, 2010b:ES-1).
- 34 ● The PTO was later modified to the California WaterFix Modified Pipeline Tunnel Option (MPTO)
35 in the 2015 CER, when the maximum design capacity of the program was reduced from 15,000
36 cfs to 9,000 cfs. Additional changes to the PTO at that time included the reduction in the number
37 of screened intakes from five to three, the elimination of the pumping plants at the intakes and
38 the intermediate pumping plant, an increase in the size of the north and main tunnels to provide
39 for gravity flow of the water from the intakes to a new Clifton Court Forebay pumping plant, and
40 placement of the new forebay within the existing footprint of the Clifton Court Forebay
41 (California Department of Water Resources 2015:2-1). The 2015 CER documented the proposed
42 MPTO facility configuration included in the 2016 Final EIR/EIS for the program. DWR issued a
43 Notice of Determination (NOD) in 2017, in accordance with CEQA, to adopt the MPTO as the
44 California WaterFix project.
- 45 ● The California WaterFix project concept was proposed to be further modified in 2018 to include
46 consideration of the Byron Tract Option (BTO) (California Department of Water Resources

1 2018). The main differences between the 2015 California WaterFix MPTO and the proposed
2 2018 California WaterFix BTO included moving the new forebay to Byron Tract to become the
3 Byron Tract Forebay and eliminating modifications to the Clifton Court Forebay. Certain
4 facilities at the tunnel shafts were relocated to minimize disturbances to wetlands and sensitive
5 biological resource habitat. DWR issued a Draft Supplemental EIR in July 2018 to present the
6 results of the impact analysis of the BTO.

- 7 ● In February 2019, then newly elected California Governor Newsom announced in his State of the
8 State address (referred to above) that he did not “support WaterFix as currently configured,” but
9 did “support a single tunnel” (Newsom 2019:3). On April 29, 2019, Governor Newsom issued
10 Executive Order (EO) N-10-19, directing several agencies, including DWR, to (among other
11 things), “inventory and assess ... [c]urrent planning to modernize conveyance through the Bay
12 Delta with a new single tunnel project.”
- 13 ● In light of the Governor’s announcement and Executive Order, DWR’s Director exercised her
14 discretion to rescind the project approval, decertify the Final EIR, rescind a set of bond
15 resolutions, and withdraw permit applications associated with California WaterFix in May 2019.
16 The CEQA process for the proposed Delta Conveyance Project would, as appropriate, use
17 relevant information from the past environmental planning process for California WaterFix, but
18 the proposed project would undergo a new, stand-alone environmental analysis leading to
19 issuance of a new EIR.
- 20 ● In 2019, DWR launched a new planning effort for a new project, eventually named the Delta
21 Conveyance Project, that began with a fresh look at the historical planning information, building
22 on areas of agreement and deviating where new concepts or configurations were identified.
- 23 ● Potential Sacramento River intake sites, including those of the proposed project, were identified
24 previously by a Fish Facilities Technical Team made up of multiple interested parties,
25 considered, and evaluated in support of the Delta Habitat Conservation and Conveyance
26 Program and the associated California WaterFix project. For the Delta Conveyance Project, the
27 Delta Conveyance Design and Construction Authority (DCA) reviewed and reconsidered the
28 previously considered intake site locations again in 2019 and reexamined the reach of the
29 Sacramento River between Freeport and the confluence with Sutter Slough for other viable
30 intake sites (Delta Conveyance Design and Construction Authority 2022b, 2022c:1). Five
31 candidate sites were analyzed relative to each other based on the following criteria.
 - 32 ○ Bathymetry and river encroachment
 - 33 ○ Property impacts
 - 34 ○ Built environment impacts
 - 35 ○ Proximity to existing development
 - 36 ○ Geotechnical concerns
 - 37 ○ Environmental and habitat disruption
 - 38 ○ Roads and traffic impacts

39 The two intake locations chosen for the proposed project (6,000 cfs) would require the shortest
40 intake structures and minimize conflicts with existing land uses and residential structures. A
41 third intake location for a higher-capacity 7,500 cfs alternative was also selected. For details
42 about how the other intake sites were considered and screened out, see Attachment A to the

- 1 Engineering Project Reports (Delta Conveyance Design and Construction Authority 2022b,
2 2022c).
- 3 • An NOP, issued in January 2020, officially started the CEQA scoping process to solicit
4 information on the scope for the proposed Delta Conveyance Project EIR.
 - 5 • Following the 2020 NOP and consideration of scoping comments, DWR screened a range of
6 alternatives and began evaluating potential impacts from constructing, operating, and
7 maintaining conveyance facility alternatives. Simultaneously, the engineering team continued to
8 refine facility designs, construction approaches, and project operations to optimize the
9 conveyance facility approach and evaluate options to further reduce environmental effects.

10 **3A.2.1 Delta Conveyance Project EIR Process**

11 This Final EIR is being prepared for the proposed Delta Conveyance Project by DWR as the CEQA
12 state lead agency. A separate EIS is being prepared by the U.S. Army Corps of Engineers (USACE) as
13 the National Environmental Policy Act (NEPA) lead agency. This Final EIR is prepared to meet the
14 requirements of CEQA and the CEQA Guidelines and be compatible with NEPA to facilitate
15 development of the USACE EIS.

16 On January 15, 2020, DWR issued an NOP under CEQA to prepare an EIR (California Department of
17 Water Resources 2020). The proposed project identified in the NOP was described as new
18 conveyance facilities in the Delta that would add to the existing SWP infrastructure. The NOP also
19 stated that the new north Delta facilities would be sized to convey up to 6,000 cfs of water from the
20 Sacramento River to the SWP facilities in the south Delta. The NOP outlined that DWR was
21 considering alternatives with capacities ranging from 3,000 to 7,500 cfs, with varying degrees for
22 the CVP, including no involvement. The NOP initiated the CEQA scoping process after the public
23 provided input on the scope of the EIR, including concepts for potential alternatives.

24 From the project's inception, DWR directed DCA to take a fresh look at design and engineering
25 concepts. In addition to the engineering studies and development of project concepts that DCA
26 performed, they also created the Stakeholder Engagement Committee to help advise and inform the
27 DCA's refinement of design concepts to avoid or minimize impacts on the local Delta environment
28 and communities. This work and input have informed project design and engineering conducted by
29 the DCA, resulting in a robust investigation of conveyance facility alignments, facility designs and
30 locations, and project operational considerations.

31 Initially, two conveyance facility alignments (central and eastern) with varying diversion capacities
32 were considered for further evaluation in this Final EIR. After considering early environmental
33 results, comments from agencies and interested parties, and additional engineering studies, DWR
34 identified the dual conveyance Bethany Reservoir alignment (Alternative 5), also to be evaluated.

35 **3A.2.2 Proposed Delta Conveyance Project**

36 The existing SWP Delta water conveyance facilities, which include Clifton Court Forebay and the
37 Harvey O. Banks (Banks) Pumping Plant in the south Delta, enable DWR to divert water from the
38 south Delta and lift it into the California Aqueduct for delivery to participating SWP contractors
39 south of the Delta. Similarly, the existing CVP facilities, which include the C.W. "Bill" Jones (Jones)
40 Pumping Plant facilities near Clifton Court Forebay export water from the Delta into the Delta-
41 Mendota Canal.

1 The Delta Conveyance Project would construct and operate new diversion and conveyance facilities
2 in the northern Delta that would add to the existing SWP infrastructure. New intake facilities, as
3 points of diversion, would be constructed in the north Delta, along the Sacramento River near the
4 community of Hood. Diverted water supply would be conveyed in a tunnel under the Delta to
5 facilities in the south Delta for delivery of water through the SWP. The new intake facilities would
6 provide alternate locations for diversion of water from the Delta, especially during high-flow events
7 or periods when diversions at the Banks Pumping Plant are limited due to the presence of special-
8 status fish species in the south Delta. The new intake facilities would be operated in coordination
9 with the existing south Delta pumping facilities, resulting in a system also known as *dual conveyance*
10 because there would be two complementary methods to divert and convey water for the SWP.

11 The proposed Delta Conveyance Project was considered first along two alignments: the Central
12 Corridor and Eastern Corridor, as proposed in the DWR NOP (and carried forward for detailed
13 evaluation in this Final EIR and referred to as the *central* and *eastern alignments*). The proposed
14 Delta Conveyance Project central and eastern alignments would include the following facilities.

- 15 • Two intake facilities along the Sacramento River in the north Delta near the community of Hood
16 with fish-screened, on-bank intake structures. The intake sites were chosen after consideration
17 of issues raised in response to prior iterations of the proposal to create a Delta conveyance
18 facility (Delta Conveyance Design and Construction Authority 2022b, 2022c). The three most-
19 feasible potential intake locations in the north Delta have been identified through extensive
20 previous analysis, as well as additional analysis that DCA performed at DWR's request.
- 21 • A concrete-lined tunnel and associated vertical tunnel shafts to convey flow from the intakes,
22 about 40 miles to a location west of the existing SWP Clifton Court Forebay.
- 23 • A pumping plant to the west of the existing SWP Clifton Court Forebay to lift the water in the
24 tunnel from below-ground and into a new surface water impoundment (Southern Forebay).
- 25 • A Southern Forebay capable of receiving flows by gravity directly from the tunnel or from the
26 pumping plant, depending on hydraulic conditions in the Sacramento River and the forebay.
- 27 • South Delta Conveyance Facilities located at the outlet of the Southern Forebay, including an
28 outlet structure and dual tunnels to convey water to the approach channel of the Banks Pumping
29 Plant. Two flow control structures would be used to regulate flows from the Delta Conveyance
30 Project and the existing Clifton Court Forebay.
- 31 • Other ancillary facilities to support construction of the conveyance facilities, including access
32 roads, concrete batch plants, fuel stations, mitigation areas, and power transmission and/or
33 distribution lines.

34 In August 2021, when conveyance facility engineering and environmental analyses had progressed
35 further, DWR finalized the process for formally identifying the proposed project. This process took
36 into consideration the feasibility, logistics, cost, and function of each of the alternatives considered
37 on the central, eastern, and Bethany Reservoir alignments. The Bethany Reservoir alignment
38 (Alternative 5) would eliminate the pumping plant, forebay, and South Delta Conveyance Facilities
39 envisioned for the central and eastern alignments. Instead, it would divert water from the two new
40 proposed north Delta intakes via a single tunnel on an eastern alignment directly to a new pumping
41 plant and aqueduct complex near Byron Highway in the south Delta and discharge it to the Bethany
42 Reservoir for delivery to existing SWP export facilities.

1 Based on the engineering feasibility, conceptual design, constructability, and potential to reduce key
2 environmental impacts on wetlands and other waters of the United States, wildlife habitat,
3 transportation, air quality, noise, and Delta community effects, DWR selected the Bethany Reservoir
4 alignment at 6,000-cfs conveyance capacity as the proposed project (Alternative 5). The screening
5 process used to select the alternatives to be evaluated in this Final EIR is described in Section 3A.4,
6 *EIR Alternatives Screening Criteria*.

7 DWR's fundamental purpose in proposing the project is to develop new diversion and conveyance
8 facilities in the Delta necessary to restore and protect the reliability of the SWP water deliveries
9 south of the Delta, consistent with the *California Water Resilience Portfolio* (California Natural
10 Resources Agency 2020), in a cost-effective manner. The following project objectives are identified
11 for the proposed Delta Conveyance Project.

- 12 • To help address anticipated rising sea levels and other reasonably foreseeable consequences of
13 climate change and extreme weather events.
- 14 • To minimize the potential for public health and safety impacts from reduced quantity and
15 quality of SWP water deliveries, and potentially CVP water deliveries, south of the Delta as a
16 result of a major earthquake that could cause breaching of Delta levees and the inundation of
17 brackish water into the areas where existing SWP and CVP pumping plants operate in the
18 southern Delta.
- 19 • To protect the ability of the SWP, and potentially the CVP, to deliver water when hydrologic
20 conditions result in the availability of sufficient amounts of water, consistent with the
21 requirements of state and federal law, including the California and federal Endangered Species
22 Acts and Delta Reform Act, as well as the terms and conditions of water delivery contracts and
23 other existing applicable agreements.
- 24 • To provide operational flexibility to improve aquatic conditions in the Delta and better manage
25 risks of further regulatory constraints on project operations.

26 3A.3 Identification of Alternatives under CEQA

27 DWR initially identified potential alternatives to be considered for analysis in this Final EIR by
28 reviewing previous alternatives evaluated in the *Bay Delta Conservation Plan/California WaterFix*
29 *(BDCP/CWF) EIR/EIS* that were developed by the DWR engineering team and suggested during
30 previous public scoping meetings. Alternatives identified in the previous BDCP/CWF EIR/EIS were
31 not always directly or fully applicable to the Delta Conveyance Project objectives, which are more
32 narrowly focused than BDCP/CWF objectives (see Section 3A.2.2, *Proposed Delta Conveyance*
33 *Project*). Where possible, previous alternatives were modified to be more applicable to this
34 alternative screening process. Additional alternatives have been identified during the Delta
35 Conveyance Project public scoping process and from engineering studies provided by the DCA that
36 are based on guidance from EO N-10-19.

37 Under CEQA, alternatives to be included in an EIR, in addition to the No Project Alternative, must be
38 (1) potentially feasible; (2) attain most of the basic objectives of the project;³ and (3) avoid or

³ According to the California Supreme Court, CEQA lead agencies have the discretion to eliminate from further consideration an alternative that cannot achieve a project's "underlying fundamental purpose" (in *re Bay-Delta*

1 substantially lessen any of the potentially significant effects of the project, even if the alternative
2 would impede to some degree the attainment of project objectives or would be more costly. DWR, as
3 the CEQA Lead Agency, may structure its alternatives analysis around a reasonable definition of a
4 fundamental underlying purpose and need not study alternatives that cannot achieve that basic goal.

5 The range of alternatives required in an EIR is governed by a *rule of reason* that requires the EIR to
6 set forth only those alternatives necessary to permit a reasoned choice. An EIR need not consider
7 every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially
8 feasible alternatives that will foster informed decision-making and public participation. An EIR is
9 not required to consider alternatives that do not meet the underlying purpose or are infeasible.

10 Where the alternatives analyzed in this Final EIR allow for a wide range of choices with varying
11 degrees of environmental impact, the document may support the ultimate approval of not only the
12 fully developed alternatives, but also what might be called *hybrid* alternatives, whose features and
13 impacts occur within the analytical continuum between the “bookends” created by the least-
14 impactful and most-impactful alternatives, respectively.⁴ Regarding such hybrid options, agency
15 staff should prepare a written analysis that addresses the adequacy of the draft document to
16 support approval of the hybrid, citing substantial evidence, as appropriate.

17 The BDCP/CWF alternatives were retained to the extent possible and combined into similar groups
18 for screening. EO N-10-19 resulted in the 2020 *California Water Resilience Portfolio*, which stated
19 that the Administration was advancing a single-tunnel conveyance project under the Delta
20 (California Natural Resources Agency 2020). The Portfolio also stated that significant public
21 engagement would be conducted to design a project to limit Delta impacts and provide local
22 benefits. Because of the directive to look at a smaller, one-tunnel project, alternatives designed to
23 accommodate a capacity greater than 7,500 cfs were excluded from consideration.

24 Prior to release of the 2020 NOP, the initial screening effort focused on whether these alternatives
25 could “feasibly attain most of the basic objectives of the project” (CEQA Guidelines § 15126.6 (a)). If
26 the initial screening process indicated that an alternative could meet most of the Delta Conveyance
27 Project objectives, it was retained for consideration in this alternatives screening analysis. At the
28 time of the publication of the NOP, the information related to the potential EIR alternatives was
29 preliminary.

30 The 2020 NOP stated that the proposed project would construct and operate new conveyance
31 facilities in the Delta that would add to the existing SWP infrastructure. New points of diversion
32 would be located along the Sacramento River, between Freeport and the confluence with Sutter
33 Slough. The new conveyance facility would include a tunnel to convey water from the new intakes to
34 the existing Banks Pumping Plant. The NOP identified two broad “corridors” and a total diversion
35 capacity of 6,000 cfs. These alternatives (Dual Conveyance Central Tunnel Alignment with 6,000-cfs
36 capacity and Dual Conveyance Eastern Tunnel Alignment with 6,000-cfs capacity) are analyzed in
37 this Final EIR as Alternatives 1 and 3, respectively.

Programmatic Environmental Impact Report Coordinated Proceedings (2008) 43 Cal.4th 1143, 1165.) The requirement that a CEQA alternative must meet “most” project objectives should be understood with this qualification in mind.

⁴ See, for example, *Village Laguna of Laguna Beach, Inc. v. Board of Supervisors* (1982) 134 Cal.App.3d 1022, 1028–1029, *California Oak Foundation v. Regents of University of California* (2010) 188 Cal.App.4th 227, 274–277, and *Cherry Valley Pass Acres and Neighbors et al. v. City of Beaumont* (2010) 190 Cal.App.4th 316, 353–356.

1 During the EIR scoping process, 3,500 separate comments were submitted in 2,200 letters, emails,
2 and comment cards, and verbal comments from 2,000 individuals were transcribed. More than 500
3 comments were related to the development of alternatives. After the close of the formal comment
4 period, an additional 44 letters and emails, totaling nearly 150 individual comments, were received.
5 Of the comments received after the close of the formal scoping period, nearly 30 additional
6 comments related to the development of alternatives were identified.

7 Some comments described specific potential alternatives related to conveyance but varied in
8 footprint from the proposed project described in the NOP. Some comments described methods to
9 reduce reliance upon Delta water supplies, including water conservation, recycling, and use of other
10 water supplies, such as conjunctive use programs to ensure adequate groundwater recharge
11 operations. The scoping report can be found in Appendix 1A, *July 2020 Delta Conveyance Project*
12 *Scoping Summary Report and Addenda*.

13 The alternatives, described below, that met most of the project objectives were grouped into four
14 alternative concepts for consideration in the first-level screening, as follows.

- 15 • Dual Conveyance
- 16 • Isolated Conveyance
- 17 • Through-Delta Conveyance with Proposed Diversion Facility
- 18 • Through-Delta Conveyance with No Diversion Facility

19 **3A.3.1 Dual Conveyance**

20 **3A.3.1.1 Dual Conveyance Central Tunnel Alignment**

21 The dual conveyance central tunnel alignment alternative would involve building one, two, or three
22 (depending on selected conveyance capacity) new intakes with fish screens on the eastern bank of
23 the Sacramento River in the north Delta, between Freeport and Sutter Slough, to provide operational
24 flexibility for the SWP. Operated in coordination with the existing south Delta pumping facilities, the
25 resulting dual conveyance system would have two complementary methods to divert and convey
26 water. Water diverted at the intakes during high flow periods would be conveyed south in a single
27 tunnel to a new Southern Complex (South Delta Pumping Plant, Southern Forebay, and South Delta
28 Conveyance Facilities) in the south Delta on Byron Tract adjacent to and west of Clifton Court
29 Forebay. Intakes would have a maximum capacity of 3,000 or 1,500 cfs, used in combination, which
30 would achieve the selected capacity. State-of-the-art cylindrical tee fish screens are proposed. The
31 three most feasible potential intake locations in the north Delta have been identified through
32 extensive previous analysis, as well as additional analysis that DCA performed at DWR's request
33 (Delta Conveyance Design and Construction Authority 2022a).

34 The central tunnel alignment includes options for conveyance capacities of 3,000, 4,500, 6,000, or
35 7,500 cfs. A single northern tunnel would connect intakes to each other and extend approximately
36 8 miles south, to the Twin Cities Complex on the eastern side of Interstate (I-) 5, near Lambert Road.
37 The Twin Cities Complex would contain a double tunnel-boring machine (TBM) launch shaft, rail-
38 served materials depot, reusable tunnel material (RTM) treatment and storage, and appurtenant
39 facilities. From the Twin Cities Complex, the central alignment main tunnel would connect with
40 shafts at New Hope Tract; Staten, Bouldin, Mandeville, and Bacon Islands; and the Working Shaft and
41 new South Delta Pumping Plant on Byron Tract, approximately 39 miles from the intakes. Along the

1 route, the tunnel would also pass below Venice and Victoria Islands. The proposed single main
2 tunnel and connecting tunnel reaches would be constructed at a depth of approximately 165 feet
3 below ground surface. Tunnel shafts for launching and retrieving the TBM would be constructed a
4 maximum of 15 miles apart along the tunnel route. The tunnel shaft pads would be constructed with
5 a top elevation of about 1 foot above surrounding levees on the island or tract where the shaft is
6 located. Following completion of the tunnel construction, the tunnel shaft would be raised above the
7 shaft pad to an elevation of the 200-year flood event and sea level rise for Year 2100, as defined by
8 DWR. Additional maintenance shafts would be established approximately every 4 to 6 miles
9 between launch and reception shafts to allow access for inspection, replacement, or repair of TBM
10 components. Excavated material from tunneling (i.e., RTM) would be tested, dried, and stockpiled
11 for reuse as much as possible, such as for constructing the forebay embankments. RTM would be
12 treated and stored at launch shaft sites until needed.

13 The Southern Complex would consist of a pumping plant to convey water from the tunnel into a
14 750-acre aboveground forebay (i.e., Southern Forebay) with a normal operating capacity of 9,000
15 acre-feet, contained by earthen embankments 28 feet high and 32 feet wide at the crest. The forebay
16 embankments would be constructed using materials from excavations and RTM to the extent
17 possible. Most South Delta Pumping Plant facilities would be placed aboveground on a raised site
18 pad along the Southern Forebay embankment to protect the facilities from the 200-year flood event
19 with climate change-induced hydrology, sea level rise for year 2100, freeboard criteria, and wind-
20 fetch wave run-up. Facilities were designed for 10.2 feet of sea level rise, which is an extreme
21 estimate and not what DWR anticipates will be the actual sea level rise at 2100. Control and outlet
22 structures would connect the Southern Forebay to new South Delta Conveyance Facilities. The
23 proposed South Delta Conveyance Facilities would extend from the new Southern Forebay to the
24 existing SWP Banks Pumping Plant inlet channel via two tunnels that would pass under Byron
25 Highway. Under the 7,500-cfs capacity option, an additional, single tunnel would extend east from
26 the new control structure adjacent to the SWP Banks Pumping Plant approach channel to the CVP
27 Jones Pumping Plant approach channel.

28 The central tunnel alignment would also involve roadway and bridge modifications, levee
29 construction or improvements, railroad spur extensions, temporary and permanent parking
30 facilities (i.e., park-and-ride lots), and temporary and permanent power facilities.

31 **3A.3.1.2 Dual Conveyance Eastern Tunnel Alignment**

32 The Dual Conveyance Eastern Tunnel Alignment alternative would be similar to the dual conveyance
33 central tunnel alignment alternative, except for the location of the main tunnel alignment. Major
34 features and components, such as the north Delta intakes, northern tunnels, Twin Cities Complex,
35 and the Southern Complex, would be the same as described for the dual conveyance central tunnel
36 alignment, including the intake capacity options of 3,000 cfs, 4,500 cfs, 6,000 cfs, and 7,500 cfs. The
37 main difference would be that the main tunnel alignment from the Twin Cities Complex to the new
38 Southern Forebay pumping plant would extend farther east in the vicinity of I-5, with tunnel shafts
39 at New Hope Tract, Canal Ranch Tract, Terminous Tract, King Island, Lower Roberts Island, Upper
40 Jones Tract, and the Working Shaft and South Delta Pumping Plant on Byron Tract, approximately
41 42 miles from the intakes. Along the route, the tunnel would also pass under Brack Tract, Rindge
42 Tract, Lower Jones Tract, and Victoria Island. Launch shafts south of the Twin Cities Complex would
43 be constructed on Lower Roberts Island and Byron Tract (Working Shaft and South Delta Pumping
44 Plant). Five maintenance shafts and three reception shafts also would be constructed.

1 **3A.3.1.3 Dual Conveyance East Canal**

2 The Dual Conveyance East Canal alternative entails the construction and operation of up to three
3 new north Delta intakes, with fish screens and associated pipeline/canal conveyance facilities with a
4 total capacity of 3,000–7,500 cfs, depending on the option selected, and the operation of the SWP as
5 a dual conveyance facility. Water primarily would be conveyed from the north Delta to the south
6 Delta through up to three intakes on the eastern bank of the Sacramento River, between Clarksburg
7 and Walnut Grove. Water would be diverted from the Sacramento River into pipelines leading to
8 intake-pumping plants. Water would travel through sedimentation basins and be pumped into
9 another set of pipelines, eventually reaching a lined or unlined canal approximately 30 miles long.
10 Once in the canal, water would flow by gravity south along the eastern side of the Delta to a new
11 intermediate pumping plant, and then to a new forebay on Byron Tract, adjacent to and south of
12 Clifton Court Forebay. The new canal would cross watercourses through culvert or tunnel siphons.
13 Aboveground facilities would be designed to withstand the 200-year flood event and sea level rise
14 for Year 2100, as defined by DWR. It is anticipated that the amount of materials required for
15 construction of the canal levees would be similar to the amount of material excavated along the
16 canal alignment.

17 **3A.3.1.4 Dual Conveyance West Canal**

18 Under the Dual Conveyance West Canal alternative, up to three intakes with fish screens on the west
19 bank of the Sacramento River between Clarksburg and Walnut Grove would divert water into
20 pipelines leading to intake pumping plants with a total capacity of 3,000–7,500 cfs depending on the
21 option selected, and the operation of the SWP, as a dual conveyance facility. Water would travel
22 through sedimentation basins and be pumped into another set of pipelines to a lined or unlined
23 canal. Water would be carried south along the western side of the Delta to a new intermediate
24 pumping plant and then pumped through a tunnel to a continuing canal to a new forebay on Byron
25 Tract immediately northwest of Clifton Court Forebay. Along the conveyance route, diverted water
26 would travel under existing watercourses and one rail crossing through culvert siphons. This
27 arrangement would enhance water supply operational flexibility, using forebay storage capacity to
28 regulate flows from north Delta intakes to south Delta pumping plants.

29 New connections would be created between the forebay on Byron Tract and the Banks and
30 potentially the Jones pumping plants, along with control structures to regulate the relative
31 quantities of water flowing from the north Delta and the south Delta. Use of existing SWP/CVP south
32 Delta export facilities would continue. This facility could convey up to 7,500 cfs from the north Delta.
33 The west alignment would be approximately 52 miles long from the north Delta intakes to the
34 forebay on Byron Tract.

35 **3A.3.1.5 Dual Conveyance with New Intakes at Sacramento Weir**

36 A dual conveyance with new intakes at Sacramento Weir alternative would include intake capacities
37 from 3,000 cfs to 7,500 cfs, a tunnel between the Sacramento River near Sacramento Weir and the
38 SWP and CVP pumping plants, and the continued use of the South Delta pumping plants. This
39 alternative would include up to three intakes along the Sacramento River near the Sacramento Weir
40 and a tunnel that would extend more than 30 miles to the Twin Cities Complex tunnel launch shaft
41 site, as described in Section 3A.3.1.1, *Dual Conveyance Central Tunnel Alignment*, near Twin Cities
42 Road and I-5 for connection to a tunnel that would extend more than 30 miles to Clifton Court
43 Forebay. The tunnel between the intakes near the Sacramento Weir and tunnel launch shaft site at

1 the Twin Cities Complex would require at least one tunnel reception shaft and three maintenance
2 shafts to be located near West Sacramento, Freeport, Clarksburg, and Hood.

3 **3A.3.1.6 Dual Conveyance Tunnel with New Intakes at Fremont** 4 **Weir and Decker Island**

5 The dual conveyance tunnel with new intakes at Fremont Weir alternative would include a
6 sequentially phased conveyance alternative with intakes located near Fremont Weir and Decker
7 Island. The conveyance facility also could be phased sequentially to extend connections to non-
8 SWP/CVP water connections. The intake near the Fremont Weir would provide an intake capacity of
9 3,000–7,500 cfs, depending on the option selected, with intakes located in the vicinity of the
10 Fremont Weir on the Sacramento River.

11 The first phase of the alternative would involve construction of a new 3,000–4,000-cfs capacity
12 intake (expandable to 6,000 cfs in the second phase of this plan) on the Sacramento River near
13 Fremont Weir. From there, a 65-mile pipeline/tunnel would be constructed under the Yolo Bypass,
14 the Sacramento River near Decker Island, Sherman Island, the San Joaquin River, Jersey Island, and
15 portions of Contra Costa County near Oakley to a location near Clifton Court Forebay. The pipeline
16 would be constructed in the Yolo Bypass, using open-cut trenches that would be covered following
17 construction. The tunnel would extend from the Yolo Bypass to the location near Clifton Court
18 Forebay with connections to Clifton Court Forebay. The tunnel would require shafts approximately
19 every 4 to 6 miles. Connections to North Bay, northern Delta cities and agencies, South Bay, Contra
20 Costa, and Los Vaqueros Reservoir East Bay Municipal Utility District would be considered.

21 Three new intakes would be constructed (up to 3,000 cfs each to divert up to 7,500 cfs) on the
22 Sacramento River near Decker Island with a pump station and a pipeline/tunnel under Sherman
23 Island, the San Joaquin River, Jersey Island, and Contra Costa County to Bethany Reservoir, with
24 connections to Clifton Court Forebay established in a later phase. A tunnel would extend from the
25 intakes up to 30 miles under Decker, Sherman, and Jersey Islands and the San Joaquin River to the
26 existing Clifton Court Forebay or Bethany Reservoir. The tunnel would include tunnel launch shafts
27 at Decker Island and either Clifton Court Forebay or Bethany Reservoir. Tunnel maintenance or
28 reception shafts would be located near Jersey Island, Brentwood, and Oakley, and more maintenance
29 shafts possibly would be required for connection to Bethany Reservoir.

30 It should be noted that CDFW has restored wetlands on approximately 25% of Decker Island, and
31 70% of the island has been modified by a new sand and soil quarry. The remaining portion of the
32 island is part of the Sacramento Deep Water Ship Channel project facilities and operated by USACE
33 and the Port of West Sacramento.

34 **3A.3.1.7 Dual Conveyance with New Intakes at Decker Island**

35 A dual conveyance with new intakes at Decker Island alternative would include up to three intakes
36 for total capacities from 3,000 cfs to 7,500 cfs, a tunnel between Decker Island and the SWP and CVP
37 pumping plants, and the continued use of the south Delta pumping plants. Placement of more than
38 one intake would be difficult because multiple intakes would be separated by at least 1 mile and the
39 shoreline along the Sacramento River is less than 2 miles long. A tunnel would extend from Decker
40 Island up to 30 miles under Decker, Sherman, and Jersey Islands and the San Joaquin River to the
41 existing Clifton Court Forebay or Bethany Reservoir. The tunnel would include tunnel launch shafts
42 at Decker Island and either Clifton Court Forebay or Bethany Reservoir. Tunnel maintenance or

1 reception shafts would be located near Jersey Island, Brentwood, and Oakley, and more maintenance
2 shafts possibly would be required for connection to Bethany Reservoir.

3 It should be noted that CDFW has restored wetlands on approximately 25% of Decker Island, and
4 70% of the island has been modified by a new sand and soil quarry. The remaining portion of the
5 island is part of the Sacramento Deep Water Ship Channel project facilities and operated by USACE
6 and the Port of West Sacramento.

7 **3A.3.1.8 Dual Conveyance Bethany Reservoir Alignment**

8 Interested parties presented several comments about potential impacts on the community of
9 Discovery Bay from construction of a new Southern Forebay. In response, the DCA developed a new
10 alignment that would eliminate the need to construct a new southern forebay and pumping plant
11 adjacent to the existing Clifton Court Forebay. The dual conveyance Bethany Reservoir alignment
12 alternative would have a diversion capacity of 6,000 cfs and use the same two intakes along the east
13 bank of the Sacramento River as the central and eastern alignment, which would provide project
14 design capacity of 6,000 cfs. Each intake would divert a maximum of 3,000 cfs and have the
15 proposed state-of-the-art cylindrical tee fish screens. From the intakes, the tunnel would follow the
16 same route as the central and eastern alignments to the Twin Cities Complex. From the Twin Cities
17 Complex, the tunnel would follow the eastern tunnel alignment as far as the Lower Roberts Island
18 launch shaft, which would be a double launch shaft similar to that at Twin Cities. From there, the
19 tunnel would take a different route to the south of Clifton Court Forebay, with additional shafts at
20 Upper Jones Tract and Union Island, before terminating at the reception shaft at a new set of
21 facilities called the Bethany Complex. The Bethany Complex would be located southeast of Clifton
22 Court Forebay, off Mountain House Road, approximately 0.5 miles south of the intersection with
23 Byron Highway.

24 The Bethany Complex would consist of the Bethany Reservoir Pumping Plant and Surge Basin, the
25 Bethany Reservoir aqueduct, and the Bethany Reservoir Discharge Structure. The main tunnel
26 would terminate at a reception shaft within the surge basin adjacent to the Bethany Reservoir
27 Pumping Plant. The pumping plant would convey water approximately 2.5 miles through a pipeline
28 aqueduct and raise it to enter Bethany Reservoir, which is at 245 feet above sea level, through a new
29 discharge structure on the bank of the reservoir. The Bethany Reservoir Pumping Plant would be a
30 multilevel underground structure with its roof at grade and appurtenant structures aboveground.
31 The surge basin would extend from existing grade to about 30 or 40 feet below grade. The aqueduct
32 would be laid primarily in trenches and backfilled, but two reaches would require the pipes to be
33 laid in tunnels beneath Jones Pumping Plant discharge penstocks and the existing Bethany Reservoir
34 Conservation Easement. These tunnel reaches would not be as deep as the main tunnel and would
35 be constructed with sequential excavation methods with roadheader machines. Soil material
36 removed from the tunnels and the open-cut trenches would be used to refill the trenches and
37 develop contours adjacent to the aqueduct.

38 **3A.3.2 Isolated Conveyance**

39 *Isolated conveyance* involves conveying water from the Sacramento River to the south Delta without
40 continued use of the existing south Delta diversions. These alternatives could include potential new
41 points of diversion at various locations in the north Delta and facilities to move water from new
42 points of diversion to the existing SWP and CVP pumping facilities in the south Delta. In some cases,
43 the alternatives involve abandoning the south Delta intakes.

1 **3A.3.2.1 Isolated Conveyance New Intakes at Fremont Weir and Decker** 2 **Island**

3 Under this alternative, facilities would be the same as the dual conveyance alternative in Section
4 3A.3.1.6, *Dual Conveyance Tunnel with New Intakes at Fremont Weir and Decker Island*, except it
5 would not involve operation of the existing SWP conveyance facilities. This would be an isolated
6 conveyance, no longer involving operation of the SWP and CVP south Delta diversion facilities at
7 Clifton Court Forebay and Tracy Fish Collection Facility on Old River, respectively. The existing
8 hydraulic connections between the SWP and CVP south Delta diversions at Clifton Court Forebay
9 and Tracy Fish Collection Facility would be closed.

10 Early in the CEQA analysis of the BDCP, DWR considered, but screened out, an alternative to the
11 conveyance component called the Initial Screening Conveyance Alternative B6, *Isolated Conveyance*
12 *with a Tunnel between the Sacramento River near Fremont Weir and the SWP and CVP Pumping*
13 *Plants, Isolated Conveyance with a Tunnel between the Sacramento River near Decker Island to Clifton*
14 *Court Forebay and Bethany Reservoir, and Continued Use of the South Delta Intakes*. At that time, this
15 alternative was eliminated from further evaluation because it would require a longer alignment than
16 most other isolated conveyance alignments considered and would therefore increase the extent of
17 disturbance to communities and habitat along this conveyance alignment and be drastically more
18 expensive to construct than substantially shorter alignments. This alternative also was eliminated
19 because the amount of water diverted from the Sacramento River would be less than under other
20 isolated conveyance alternatives, and, therefore, the amount of water to be diverted at the south
21 Delta intakes would be greater than under other isolated conveyance alternatives. Based on a 2010
22 study, it was believed that ability to divert water in the western Delta near Decker Island could also
23 be limited due to the presence of delta smelt (*Hypomesus transpacificus*) in the western Delta.
24 During months where smelt were not in the area, salinity could be too high for diversions from the
25 western Delta, especially as sea level rise progresses.

26 **3A.3.2.2 Isolated Conveyance Tunnel with Sacramento River Intakes**

27 This alternative would be the same as the dual conveyance alternative discussed in Section 3A.3.1.1,
28 with a project design capacity of 7,500 cfs, except it would not involve operation of the existing SWP
29 conveyance facilities. This would be an isolated conveyance, no longer involving operation of the
30 SWP and CVP south Delta diversion facilities at Clifton Court Forebay and Tracy Fish Collection
31 Facility on Old River, respectively. The existing hydraulic connections between the SWP and CVP
32 south Delta diversions at Clifton Court Forebay and Tracy Fish Collection Facility would be closed.

33 **Isolated Conveyance West Canal with Sacramento River Intakes**

34 This alternative would be the same as the Dual Conveyance West Canal alternative discussed in
35 Section 3A.3.1.4, *Dual Conveyance West Canal*, except it would not involve operation of the existing
36 SWP conveyance facilities. This would be an isolated conveyance, no longer involving operation of
37 the SWP and CVP south Delta diversion facilities at Clifton Court Forebay and Tracy Fish Collection
38 Facility on Old River, respectively. The existing hydraulic connections between the SWP and CVP
39 south Delta diversions at Clifton Court Forebay and Tracy Fish Collection Facility would be closed.

1 **Isolated Conveyance East Canal with Sacramento River Intakes**

2 This alternative would be the same as the Dual Conveyance East Canal alternative discussed in
3 Section 3A.3.1.3, *Dual Conveyance East Canal*, except it would not involve operation of the existing
4 SWP south Delta diversion facilities. This would be an isolated conveyance, no longer involving
5 operation of the existing SWP/CVP south Delta points of diversion at Clifton Court Forebay and
6 Tracy Fish Collection Facility on Old River. The existing hydraulic connections between the
7 SWP/CVP south Delta points of diversion at Clifton Court Forebay and the Tracy Fish Collection
8 Facility on Old River would be closed.

9 **Isolated Conveyance East Canal with Feather River Intakes**

10 The *Isolated Conveyance East Canal with Feather River Intakes* alternative would include intakes
11 along the lower Feather River with a project design capacity of at least 7,500 cfs. The intakes would
12 convey water to a pumping plant for continued conveyance in an approximately 150-mile-long canal
13 to discharge river into the American River and Stanislaus River. The water would continue to flow
14 through Delta channels to the existing SWP and CVP south Delta diversions. Aboveground facilities
15 would be designed to withstand the 200-year return flood and sea level rise for Year 2100. It is
16 anticipated that the amount of materials required for construction of the canal levees will be similar
17 to the amount of material excavated along the canal alignment.

18 Early in the CEQA analysis of the BDCP, DWR considered, but screened out, an alternative to the
19 conveyance component called the Initial Screening Conveyance Alternative B4, *Isolated Conveyance*
20 *with a Lined or Unlined East Canal between the Sacramento River near the Confluence with the*
21 *Feather River and the Lower San Joaquin River, and Abandonment of Existing South Delta Intakes*. At
22 the time, this alternative was eliminated from further evaluation because it would be at least three
23 times longer than most other isolated conveyance alignments considered and therefore would
24 increase the extent of disturbance to communities and habitat along this conveyance alignment and
25 be drastically more expensive to construct than substantially shorter alignments. Based on
26 preliminary evaluation, this alternative also was eliminated because the amount of water available
27 for export at the SWP and CVP pumping plants would be substantially less than under the existing
28 conditions. This conveyance alternative does not include use of the existing south Delta intakes, and
29 there would be no opportunity to replace the reduction in exports from these south Delta intakes.
30 Therefore, the total SWP and CVP exports probably would be substantially less than under existing
31 conditions.

32 **3A.3.2.3 Isolated Conveyance with San Joaquin River Intake**

33 This alternative would include an intake and a pumping plant along the San Joaquin River near
34 Antioch or Pittsburg and a tunnel that would extend approximately 20 miles to the approach
35 channels of the existing Banks Pumping Plant, and possibly the Jones Pumping Plant. The intakes
36 would be located to avoid lands within the Antioch Dunes National Wildlife Refuge. The tunnel
37 would include tunnel launch shafts near the existing SWP or CVP pumping plants and at the intakes.
38 The tunnel would include two tunnel maintenance shafts, possibly near Brentwood and Byron. Delta
39 water salinity near Pittsburg in summer and fall months exceeds the salinity near the SWP and CVP
40 diversions along the Old River. Therefore, a desalination facility would be required to treat at least a
41 portion of the diverted flows. A tunnel would be constructed to convey treated water from the
42 desalination facility approximately 18 miles to the existing SWP and CVP pumping plants.

1 Early in the CEQA analysis of the BDCP, DWR considered, but screened out, an alternative to the
2 conveyance component called the Initial Screening Conveyance Alternative B7, *Isolated Conveyance*
3 *with Diversion from the San Joaquin River near Antioch and Desalination Facilities, a Tunnel between*
4 *the Desalination Facilities and the SWP and CVP Pumping Plants, and Abandonment of Existing South*
5 *Delta Intakes*. At the time, this alternative was eliminated from further evaluation because this
6 alternative would depend upon the capacity of the desalination facility, the intake along the San
7 Joaquin River shoreline could extend more than 3 miles for a 15,000-cfs intake, and the desalination
8 facility could be several square miles in size. This could result in substantial impacts on land use,
9 given the generally dense existing development in the affected areas. In addition, desalination of up
10 to 15,000 cfs of flow would add an enormous ongoing cost not required for other options and result
11 in substantial energy use and, absent the development of practicable “green” power sources that
12 could replace fossil fuel inputs, related substantial greenhouse gas (GHG) emissions. Such emissions
13 could undermine California’s ability to meet its legislative mandate under the California Global
14 Warming Solutions Act of 2006 to reduce the state’s 2020 GHG emissions to 1990 levels. Other
15 options would convey fresh water that would not need to be desalted prior to transport.

16 The ability to divert water in the western Delta near Antioch also could be limited due to the
17 presence of delta smelt in the western Delta. Presence of delta smelt and longfin smelt (*Spirinchus*
18 *thaleichthys*) in the western Delta during the period when high flows would occur in the Sacramento
19 River could reduce the effectiveness of a western Delta intake. During July through November,
20 salinity could be too high for diversions from the western Delta, especially as sea level rise
21 progresses.

22 **3A.3.3 Through-Delta Conveyance with Proposed Diversion** 23 **Facility**

24 **3A.3.3.1 A Water Plan for All of California**

25 Although this alternative (also known as “Congressman Garamendi’s Water Plan”) was previously
26 considered during alternatives screening for BDCP/CWF, several scoping comments from various
27 interested parties during the 2020 scoping period for the Delta Conveyance Project suggested
28 consideration of this water plan.

29 This plan includes the following actions.

- 30 • Dual conveyance consisting of: (1) a new “Little Sip” north-of-Delta diversion structure on the
31 Sacramento River near West Sacramento with a maximum capacity of 3,000 cfs (Port of West
32 Sacramento intake); (2) use of the Sacramento Deep Water Ship Channel as a means of
33 conveying water approximately 25 miles to a new intake near the southern end of the channel;
34 (3) new boat lock near the southern end of the Deep Water Ship Channel to prevent water
35 diverted from the Sacramento River from flowing into the Delta near Rio Vista; and (4) pumps at
36 the intake near the southern end of the channel to deliver water into a new 12-mile pipeline to
37 convey water through the western Delta and underneath the Sacramento and San Joaquin Rivers
38 between the Deep Water Ship Channel and existing Delta channels leading to the existing SWP
39 and CVP pumping plants in the south Delta.
- 40 • Increase in water storage capacity in areas located south of the Delta to store increased Delta
41 diversions in wet years (which the plan refers to as the “Big Gulp”) and to provide water
42 supplies in drier years.

- 1 • Increase in water recycling and conservation to improve water supply reliability in dry years in
2 areas that use water diverted from the Delta. Integration of water supply operations among
3 water agencies that use water diverted from the Delta to coordinate benefits of water recycling
4 and increased water storage.
- 5 • Improvement of Delta levees to reduce vulnerability of Delta water supplies to earthquakes, sea
6 level rise, and climate change impacts.

7 A scoping comment recommended combining this concept with the Sacramento Weir Widening
8 Project initiated by Sacramento Area Flood Control Agency and the DWR North Bay Aqueduct
9 Relocation Project and using multiple pipelines laid at a shallow depth at the bottom of Suisun Bay
10 to replace the tunnel.

11 This alternative was first proposed in March 2013 after the scoping period for the BDCP had ended
12 and analysis of the BDCP alternatives was already underway. DWR considered the alternative at the
13 time but felt that the proposal included portions of previous alternatives considered during the
14 screening process. Some of the proposed actions within this proposal were evaluated in the
15 alternatives considered in detail in the BDCP/California WaterFix EIR/EIS.

16 **3A.3.3.2 Western Delta Intake Concept**

17 The Western Delta Intake Concept includes the following actions:

- 18 • Dual conveyance, with relocation of the principal point of diversion for exports from the south
19 Delta to the west Delta.
- 20 • Levees around Sherman Island along the Sacramento River and San Joaquin River to be replaced
21 with permeable levees to allow water from the rivers to enter and exit Sherman Island. The
22 water surface inside the Sherman Island Forebay would rise and fall with the tides. Surplus
23 water (available after meeting upstream and in-Delta needs and the Delta outflow
24 requirements) would be extracted through permeable fish screen embankments on Sherman
25 Island. Water extracted at Sherman Island would be transported to the Clifton Court Forebay in
26 large tunnels, similar to those proposed in the Delta Conveyance Project, but half the length.
- 27 • Retain existing south Delta pumps to lift water into the canals going south, but also to extract
28 water directly from the Old River through new state-of-the-art fish screens on the very rare
29 occasions when there are high flows in the San Joaquin and Old Rivers. When the south Delta
30 pumps are extracting water from the Old River, water from Sherman Island that cannot be
31 moved south immediately would be stored temporarily in an enlarged Los Vaqueros Reservoir
32 and/or a new Brushy Creek Reservoir. The objective of this rearrangement of conveyance
33 facilities is to allow the extraction of as much as 30,000 cfs during the limited periods of high
34 flows in the Sacramento and San Joaquin Rivers.
- 35 • In the absence of other longer-term solutions, maintain water quality in the south Delta by
36 recirculation as necessary from the export canals to the San Joaquin River.
- 37 • Conversion of the Delta Cross Channel gates into a boat lock to prevent fish passage from the
38 Sacramento River into the central Delta.
- 39 • New Brushy Creek Reservoir near Clifton Court Forebay (with a capacity of at least 1 million
40 acre-feet), which could be used to store water diverted from Sherman Island when the total
41 Delta exports exceed the 15,000-cfs capacity of the SWP and CVP pumping plants. A conveyance
42 could be constructed between Brushy Creek Reservoir and Los Vaqueros Reservoir for

1 additional storage capacity. If Los Vaqueros Reservoir is expanded (to a capacity of at least
2 1 million acre-feet), the two reservoirs could be designed with a pumped storage hydro-electric
3 facility.

- 4 • A new lined canal to convey water from the SWP California Aqueduct and the CVP Delta-
5 Mendota Canal into the San Joaquin River upstream of Vernalis.
- 6 • Ecosystem restoration of tidal and subtidal habitat at the western end of Sherman Island, the
7 proposed Lower San Joaquin River Bypass, and Franks Tract.
- 8 • Installation of fish screens along Old River at the entrance to Clifton Court Forebay.

9 This alternative was first proposed in January 2012, after the scoping period for the BDCP had
10 ended and analysis of the BDCP alternatives was already underway. DWR considered the alternative
11 at the time but felt that the proposal included portions of previous alternatives considered during
12 the screening process.

13 **3A.3.3.3 SolAgra Water Solution Alternative**

14 The SolAgra Water Solution (SWS) project was initially proposed in 2014 in response to the
15 BDCP/California WaterFix EIR/EIS. During the 2020 scoping period for the Delta Conveyance
16 Project, SolAgra commented again, suggesting that the SWS alternative should be considered for
17 further evaluation.

18 The SWS alternative would end use of the Banks Pumping Plant. Water typically taken out at the
19 Banks Pumping Plant would flow to the confluence of the rivers at Sherman Island. Half of that
20 water would be brought onto Sherman Island using fish screen sections with low approach
21 velocities totaling 8 miles long. The remaining water would run downstream in the rivers flowing
22 toward Suisun Bay, which would provide environmental benefits.

23 The SWS would create a dual-plant, interconnected water processing system on Sherman Island.
24 Plant #1 would filter and process incoming fresh water from the Sacramento and San Joaquin Rivers
25 via multiple fish-screened intakes around Sherman Island. Plant #2 would intake brackish water
26 through fish-screened intakes on Sherman Lake and Mayberry Slough, and then would desalinate
27 this low-salinity brackish water. After processing, desalinated water from Plant #2 would be
28 blended with fresh, filtered water from Plant #1. The combining of fresh water with the treated and
29 desalinated brackish water would replace the 2.4 million acre-feet of fresh water currently
30 conveyed through the SWP in a normal water year.

31 This water (potentially up to 2.4 million acre-feet) would be pumped into a new single 28-foot
32 internal diameter/32-foot outside diameter tunnel, extending 19 miles to Bethany Reservoir, where
33 it would enter the SWP after bypassing the Banks Pumping Plant.

34 **3A.3.3.4 Portfolio-Based Proposal including Water Conveyance Facilities**

35 This portfolio-based alternative would include the following components.

- 36 • The proposed Use of Dual Conveyance with a Tunnel alternative included only 3,000 cfs north
37 Delta intake capacity using operation criteria similar to the DWR proposed project, with more
38 emphasis on increased Delta diversions in wet years and reduced Delta diversions in drier
39 years, especially in spring and fall months. It is estimated that there could be exports of 4.0 to
40 4.3 million acre-feet per year using this conveyance facility and the existing SWP and CVP south

1 Delta diversions. This total long-term diversion volume would be less than historical diversions
2 and require increased alternative water supplies south-of-Delta.

- 3 • Continued operation of the south Delta intakes.
- 4 • Increases water storage capacity in areas located south of the Delta to store increased Delta
5 diversions in wet years and provide water supplies in drier years.
- 6 • Increased water recycling and conservation to improve water supply reliability in dry years in
7 areas that use water diverted from the Delta. Integrate water supply operations among water
8 agencies that use water diverted from the Delta to coordinate benefits of water recycling and
9 increased water storage.
- 10 • Improved Delta levees to reduce vulnerability of Delta water supplies to earthquakes, sea level
11 rise, and climate change impacts.
- 12 • Provided for Delta floodplain and tidal marsh habitat restoration, but greatly reduced acreages
13 as compared to the BDCP level of restoration.
- 14 • Expanded use of science in Delta water management.

15 This alternative was first proposed in January 2013, after the scoping period for the BDCP had
16 ended and analysis of the BDCP alternatives was already underway. DWR considered this
17 alternative at the time but felt that the proposal included portions of previous alternatives
18 considered during the screening process. Some of the proposed actions within this proposal were
19 evaluated in the alternatives considered in detail in the BDCP/California WaterFix EIR/EIS.

20 **3A.3.4 Through-Delta Conveyance without New Diversion** 21 **Facility**

22 Several alternatives that continue to utilize the existing water conveyance facilities have been
23 proposed. The general concept behind these alternatives was to attempt to address water quality
24 and aquatic resource issues without construction of a facility to divert water from a location to the
25 north of the Delta or from the north Delta and facilities to convey water around the Delta water
26 channels.

27 Under the Through-Delta Conveyance Alternatives, water would be conveyed from north of the
28 Delta to the existing SWP and CVP south Delta diversions through Delta channels. Several of the
29 alternatives would include in-Delta barriers to reduce salinity intrusion from San Francisco Bay or
30 provide separate Delta channels for water as compared to fish passages. Other alternatives would
31 include improvements to existing facilities, including fish screens at the SWP south Delta diversion
32 and levee modifications.

33 This section includes descriptions of alternatives with salinity control barriers DWR previously
34 analyzed. Several other locations for salinity control barriers were suggested in the scoping process,
35 including a barrier across San Francisco Bay from Alcatraz Island to Marin County with a ship lock
36 (which could also reduce the need for sea walls with climate change) or new intakes.

37 **3A.3.4.1 Western Delta Salinity Control Barrier**

38 Western Delta salinity control facilities have been evaluated since the nineteenth century. Somewhat
39 more recently, DWR has conducted studies about the feasibility of constructing salinity barriers.

1 These studies have included the 1957 DWR Evaluation of Salinity Control Barriers and the 1960
2 DWR Evaluation of Salinity Control Facilities.

3 **Previous DWR Evaluation of Salinity Control Barriers**

4 Salinity barriers were under consideration as early as 1929. DWR's predecessor agency, the Division
5 of Water Resources, analyzed the feasibility and comparative costs and benefits of constructing a
6 salinity barrier in the Carquinez Strait in Bulletin 25 (California Department of Public Works,
7 Division of Water Resources 1930:117–123). That report concluded that it would be considerably
8 more cost effective to control salinity in the Delta for water supply through upstream reservoir
9 releases. It noted that a salinity barrier could affect commercial fisheries, presumably by impeding
10 fish migration, and would create water quality problems behind the barrier due to lack of flushing
11 flows and increase levee maintenance costs in the Delta. The 1931 Bulletins 27 and 28 reached
12 similar conclusions.

13 In 1957, DWR prepared Bulletin 60, which investigated methods to (1) convey large quantities of
14 water across the Delta without major losses to Suisun Bay and property damage to Delta property
15 owners; (2) reduce salinity in the Delta; and (3) deliver water to the San Francisco Bay Area. The
16 study results indicated that fresh water could be maintained in the Delta by either of the following
17 methods (California Department of Water Resources 1957).

- 18 ● Maintain Delta outflows to dilute poor-quality water from Suisun Bay. However, this method
19 would require additional releases of water from upstream reservoirs and reduce the amount of
20 water available for water supplies to be used in other parts of California.
- 21 ● Isolate poor-quality water from Suisun Bay from high quality Delta water with a physical
22 barrier.

23 The study evaluated three salinity barrier options: the *Junction Point Barrier Plan*, *Biemond Plan*, and
24 *Chippis Island Barrier Plan*. The *Junction Point Barrier Plan* and the *Biemond Plan* were similar, with
25 barriers and fish passage facilities located in slightly different positions along the Sacramento River,
26 as described below.

- 27 ● Operable barriers would be constructed across the Sacramento River and Steamboat Slough to
28 prevent salinity intrusion into the Sacramento River and increase the elevation of the
29 Sacramento River so that the flow would be directed through a new Cross Delta Channel with a
30 diversion structure near Isleton or through the existing CVP Delta Cross Channel with continued
31 flow into the southern Mokelumne River system.
- 32 ● Channels along the southern Mokelumne River system would be expanded to increase
33 conveyance of freshwater from the Sacramento River to the San Joaquin River.
- 34 ● A siphon would be constructed under the San Joaquin River to convey water from the
35 Mokelumne River to Middle River for continued conveyance to the south Delta intakes of the
36 SWP and CVP pumping plants.
- 37 ● Major flood control levees would be constructed throughout the central Delta to maintain flood
38 waters within the Delta, including a flood control structure on the San Joaquin River at Paradise
39 Cut, with a possible channel to divert flood waters to the south Delta intakes of the SWP and CVP
40 pumping plants.
- 41 ● The North Bay Aqueduct pumping plant and canal would be constructed to deliver water to the
42 northern San Francisco Bay Area counties.

- 1 • The South Bay Aqueduct pumping plant and canal would be constructed to deliver water to the
2 southern San Francisco Bay Area counties.

3 The Chipps Island Barrier Plan would include the following facilities to form a freshwater Delta.

- 4 • A 22,000-foot-long barrier with ship locks would be constructed across the Sacramento River
5 from a location near Pittsburg to a location near Collinsville. The barrier would be designed to
6 pass flood waters from the Delta and withstand high tide and wave events from San Francisco
7 Bay.
- 8 • Major flood control levees would be constructed throughout the Delta and Yolo Bypass to
9 maintain flood waters within the Delta.
- 10 • Major flood control levees would be constructed along Suisun Bay due to increased tidal
11 amplitude that would occur along the Contra Costa and Solano Counties shorelines on the
12 western side of the barrier.
- 13 • Methods would be developed to provide mixing within the Delta to dilute waste products from
14 municipal and industrial wastewater treatment plants, high-temperature flows from industrial
15 plants in the Delta, accumulated salts from discharges in the Delta watershed, and salt water
16 that would enter the Delta through the ship locks on the barrier.

17 The study indicated that these plans would result in adverse impacts on anadromous fish; however,
18 there could be benefits to other fish that could accommodate warmer waters. The study
19 recommended continued evaluation of the Biemond Plan, including levee improvements to reduce
20 flood risks in the Delta, and implementation of the North Bay Aqueduct.

21 **1960 DWR Evaluation of Salinity Control Facilities**

22 In 1960, DWR prepared the Preliminary Edition of Bulletin 76 (California Department of Water
23 Resources 1960), which evaluated the following plans.

- 24 • Chipps Island Barrier Project, as described above.
- 25 • Single Purpose Delta Water Project, similar to the Biemond Plan, with barriers on the
26 Sacramento River near Walnut Grove, Steamboat Slough, San Joaquin River, Piper Slough,
27 Holland Cut, Old River at Connection Slough, and Head of Old River to maintain the fresh water
28 within the central and south Delta. The Contra Costa Canal would be expanded to provide fresh
29 water to the western Delta communities and industries.
- 30 • Typical Alternative Delta Water Project, same as Single Purpose Delta Water Project, with
31 additional levee improvements along the Mokelumne and San Joaquin Rivers to improve flood
32 protection.
- 33 • Comprehensive Delta Water Project, same as Typical Alternative Delta Water Project, with
34 additional barriers along the Middle River to improve freshwater flows in the central and
35 western Delta.

36 These plans were further evaluated by the Coordination of Delta Planning Subcommittee of the
37 Interagency Delta Committee in 1963 in coordination with analysis of a “peripheral canal.” An
38 alternative suggested during the scoping process included construction of an operable flow
39 constrictor at the Carquinez Straight that would allow ships and fish to pass without impediment,
40 but peak tide or storm surge events are moderated in their ability to push salt water and water
41 volume into the Delta.

1 Early in the CEQA analysis of the BDCP, DWR considered, but screened out, an alternative to the
2 conveyance component called Initial Screening Conveyance Alternative C3, *Through Delta*
3 *Conveyance with West Delta Salinity Barrier*. At that time, DWR concluded (California Department of
4 Water Resources 2016a:3A-50–3A-51) that this alternative

5 would not meet the BDCP objectives of a brackish water system in the Delta that would support the
6 estuarine habitat required by the BDCP covered species and would reduce the ability of fish passage
7 for anadromous fish. This alternative would not support project objectives and aspects of the project
8 purpose and need that focus on creating ecological improvements in the Delta ecosystem and
9 contributing to recovery of declining listed species. Nor would the alternative meet the coequal goal
10 under the 2009 Delta Reform Act of “protecting, restoring, and enhancing the Delta ecosystem.”

11 **3A.3.4.2 Eco-Crescent/Middle River Corridor Conveyance**

12 The Eco-Crescent/Middle River Corridor Conveyance approach would develop an area within the
13 central and south Delta that would improve habitat for fishes with variable salinity and turbidity to
14 mimic historic estuarine conditions (Metropolitan Water District of Southern California 2007). A
15 separate water supply corridor would convey water from the Delta Cross Channel through the lower
16 Mokelumne River system to a siphon under the San Joaquin River for continued conveyance in an
17 isolated Middle River corridor. The Middle River corridor would be isolated from the Old and San
18 Joaquin Rivers by barriers along Middle River at Connection Slough, Railroad Cut, and Woodward
19 Canal.

20 The separated Delta corridors were similar to those recommended in Preliminary Edition of Bulletin
21 76 Comprehensive Delta Water Project (California Department of Water Resources 1960).

22 During the BDCP alternatives screening process, this concept was eventually folded in with other
23 similar concepts.

24 **3A.3.4.3 Separated Delta Corridors Plan for Water Supply Conveyance** 25 **and Fish Passage**

26 The *Delta Corridors Plan*, proposed in 2007 and revised in 2009, provided an estuarine fish passage
27 corridor along Old River from the Head of Old River into the Delta and a water supply corridor that
28 extended from the Delta Cross Channel and Georgiana Slough confluences along the Sacramento
29 River through the lower Mokelumne River and along Middle River and Victoria Canal to the SWP
30 and CVP south Delta diversions (South Delta Water Agency 2007). Fish screens would be installed at
31 Delta Cross Channel and Georgiana Slough, along the Sacramento River. Fish-handling facilities
32 would be improved at the SWP and CVP intakes. Portions of the Middle River would be dredged to
33 improve capacity. Portions of the Old River near the Delta–Mendota Canal intake and along Victoria
34 Canal would be divided to separate the fish passage and water supply corridors. Barriers would be
35 constructed at the Head of Old River, near the San Joaquin River, Old River near the Delta–Mendota
36 Canal approach channel, Old River at Grant Line Canal, Old River at Victoria Canal, Old River at West
37 Canal, Woodward Canal at Middle River, Railroad Cut at Middle River, Connection Slough at Middle
38 River, Middle River at Victoria Canal, and Franks Tract at San Joaquin River. Water would be
39 siphoned from Victoria Canal under Old River and Coney Island into West Canal. Water would be
40 pumped from north to south at the Head of Old River Barrier and the barrier on Middle River at
41 Victoria Canal.

42 The *Delta Corridors Plan* was revised in 2009 to provide fisheries with protection in the Mokelumne
43 River system upstream of Delta Cross Channel (South Delta Water Agency 2009). Meadows Slough

1 would be connected through a new channel to the Sacramento River, and operable barriers would
2 be constructed to provide a fish passage corridor from the upper Mokelumne River into the
3 Sacramento River via Lost and Meadows to improve fish passage.

4 **3A.3.4.4 New Fish Handling Facilities at Clifton Court Forebay**

5 This alternative for the Through-Delta conveyance would include modification of the SWP fish-
6 handling facilities at Clifton Court Forebay, with some differences in the locations of those fish
7 screens. Among the suggestions of this alternative are the following.

- 8 • Construction of fish screens along Old River at the existing Clifton Court Forebay and at the
9 entrance of the approach channel to the Jones Pumping Plant. Water would continue to flow
10 through existing channels to existing SWP and CVP south Delta intakes.
- 11 • Modification of fish-handling facilities at Clifton Court Forebay. Replace the Clifton Court
12 Forebay gated control structure with a new fish screen (inflatable gate/barrier) to allow for
13 normal flow into Clifton Court Forebay during the day; however, no flow would enter the
14 forebay at night, while fish are generally at rest. The pumps would operate during the day and
15 night.
- 16 • Replace Clifton Court Forebay's 1.5-mile levee with a new fish screen (inflatable gate/barrier) to
17 keep all fish in the Delta and out of Clifton Court Forebay. The barrier would allow for normal
18 flow during the day and filling of Clifton Court Forebay at night, while fish are generally sleeping.
19 The pumps would then be able to operate constantly with Clifton Court Forebay, holding 1 to 3
20 days' supply.

21 Early in the CEQA analysis of the BDCP, DWR considered, but screened out, an alternative to the
22 conveyance component called the Initial Screening Conveyance Alternative C4, *Through Delta*
23 *Conveyance with Fish Screens at Clifton Court Forebay*. At the time, this alternative was eliminated
24 from further evaluation because initial results of recent studies, including information included in
25 the recent National Marine Fisheries Service (NMFS) biological opinions (BiOps), supported a
26 phased approach that would emphasize improvements to operations of fish-handling facilities and
27 reduced predator potential within Clifton Court Forebay prior to further analysis of installation of
28 fish screens. DWR completed more than 60 studies in the past 20 years to evaluate the feasibility of
29 providing fish screens along the intakes to Clifton Court Forebay. These studies have indicated that
30 it is difficult to find a location at the Clifton Court Forebay site for a single location that would
31 provide appropriate sweeping velocities to reduce the entrainment of fish in accordance with U.S.
32 Fish and Wildlife Service (USFWS) and NMFS fish screen operations criteria or guidance. The screen
33 would have to be more than a mile long, which could expose fish to excessive times in front of the
34 screen. Because the screens are located in short sloughs with limited cross-waterways, the fish could
35 accumulate in front of the screens and be subject to predation, poor habitat quality, or increased
36 potential of entrainment at the Clifton Court Forebay screens and other intakes in the adjacent
37 portions of the south Delta.

38 **3A.3.4.5 Portfolio Approach without Water Conveyance Facilities**

39 This concept generally focuses on no new intake/conveyance facilities, but instead would utilize a
40 "portfolio" approach of demand-reduction measures (e.g., water-use efficiency actions, limiting
41 agricultural growers' allocations or ability to grow certain crops, limiting growth/development in
42 Southern California) combined with regional/local water supply reliability projects, such as new

1 storage and recycling, and infrastructure improvements to reduce water evaporation and leaks in
2 the SWP system used to deliver water south of the Delta.

3 Multiple commenters presented different versions of this alternative during NOP scoping, which
4 could also include the following actions.

- 5 • Improve through-Delta conveyance, rather than construct a new isolated facility. Delta levees
6 would be strengthened and key Delta channels dredged, similar to concepts being considered by
7 DWR and local agencies related to flood management objectives. Prevent levee failures through
8 frequent monitoring and maintenance to allow for proactive measures, using annual light
9 detection and ranging and thermal remote sensing surveys of the Delta levees, side-scan sonar
10 surveys of the underwater parts of the levee, and ground-penetrating radar to inventory and
11 assess levee construction integrity. Expand the use of strategically placed rock stockpiles in the
12 Delta for rapid response to potential levee failures identified through the expanded monitoring
13 program.
- 14 • Maintain flood management levels; the levees would need to be raised as sea level rise and
15 climate change flood flows increase in the future.
- 16 • A “Natural Systems” approach to improving Delta levees with setback levees and channel margin
17 habitat at critical and feasible locations, levee improvements where setback levees would not be
18 practical, and identification of some Delta islands to intentionally flood with levee breaches to
19 create freshwater storage and habitat and avoid unplanned levee failures.
- 20 • Reduce other regions’ reliance on water from the Delta by investing in water-use efficiency,
21 water recycling, dry or hydroponic farming methods, and other advanced technologies. Some
22 comments suggested reductions in existing SWP and/or CVP water deliveries to south-of-Delta.
- 23 • Improvements to Clifton Court Forebay and California Aqueduct system to improve water
24 delivery efficiency, including reducing water losses, such as leaks. Portions of the California
25 Aqueduct could be covered with solar panels to generate energy and reduce evaporation.

26 **3A.3.5 Integration of Water Conveyance with Other Projects**

27 Multiple suggestions were provided as conveyance alternatives or portions of conveyance
28 alternatives that would require a more extensive consideration of integration with other SWP
29 projects and other infrastructure projects in California.

- 30 • Along the California Aqueduct, install a microhydropower system to generate energy.
- 31 • Install microhydropower system in the Delta Conveyance Project tunnels or use tunnel structure
32 to support aboveground solar panels.
- 33 • Install a low-profile, aboveground “tube” to convey water from the north Delta to the south
34 Delta to reduce construction activities.
- 35 • Place natural draft barges with desalination skids in Monterey Bay. Desalinated water would be
36 brought down to San Luis Reservoir, 50 miles away.
- 37 • Install desalination plants on abandoned offshore oil drilling platforms in Los Angeles.
- 38 • Modify SWP and CVP operations by closing the Delta Cross Channel and build dams.
- 39 • Install shipping locks and tidally controlled louvers in San Pablo Bay at Benicia Bridge to reduce
40 salt water intrusion into the Delta.

- 1 ● Place swales on contours throughout watersheds in order to raise water tables, reduce runoff,
2 encourage healthy and hydrated forests, and, over time, increase available water resources to
3 the southern portion of California. Reconnect Delta Distributary Channels (i.e., Fremont Weir to
4 Tule Ditch in the Yolo Bypass, Sacramento Deep Water Channel, Railroad Cut, Snodgrass Slough,
5 Elk Slough, Delta Cross Channel, and Georgiana Slough) to allow better water quality from the
6 Sacramento River to push and be drawn across the western, central, and eastern parts of the
7 Delta to the south to improve water quality by moving water from the Sacramento River across
8 the Delta. The flows in these distributaries would function for habitat, water quality, and
9 carriage water and as water supply deliveries for the south Delta SWP pumps. The reconnected
10 head ends of these tributaries would need to be fish-screened and have operable gates (like the
11 Delta Cross Channel). Operable gates would be required to avoid redirected flood flows. The fish
12 screen would keep the Sacramento system fish in the main channel for reduced straying and
13 increased juvenile emigration survival.
- 14 ● Provide connections between SWP and non-SWP water suppliers north of the Delta to integrate
15 water supplies and water supply reliability.
- 16 ● Install locations for diversion facilities in the North Delta. This alternative would include
17 different diversion locations that avoid or reduce damage to Delta communities and recreational
18 boating and protect fish. This suggestion was based on the theory that impacts on Delta
19 communities should be equally weighted with impacts on fish and wildlife.
- 20 ● Other commenters have advanced ideas for alternatives that have more specifically suggested
21 alternative locations for new points of diversion (see discussions for the SolAgra Water Solution
22 alternative in Section 3A.3.3.3, *SolAgra Water Solution Alternative*, and the Western Delta Intake
23 Concept in Section 3A.3.4.1, *Western Delta Salinity Control Barrier*).
- 24 ● Several commentors suggested construction of multiple SWP intakes in the south and west Delta
25 to add capacity and flexibility during high flow periods or when regulatory criterial restrict use
26 of some intakes to protect fish or water quality, such as along southern Victoria Canal.

27 **3A.4 EIR Alternatives Screening Criteria**

28 CEQA Guidelines Section 15126.6(a) states that “an EIR shall describe a range of reasonable
29 alternatives to the project or to the location of the project, which would feasibly attain most of the
30 basic objectives of the project but would avoid or substantially lessen any of the significant effects of
31 the project and evaluate the comparative merits of the alternatives.” The EIR is to consider a
32 “reasonable range” of alternatives to foster informed decision-making and public participation.

33 The screening process for the Delta Conveyance Project Draft EIR only focused on identifying
34 alternatives to the proposed project; it is not a project objective development exercise. Therefore,
35 the screening starts with the provision that the proposed project objectives are in place, and the
36 alternatives, as discussed below, are screened with this specific objective in mind. The proposed
37 project presented in the NOP (Dual Conveyance Central Tunnel Alignment or Dual Conveyance
38 Eastern Tunnel Alignment, operating at 6,000 cfs) is not included specifically in the screening
39 exercise; it is the project against which the alternatives are compared in the screening. The project
40 proposed in the NOP was developed to meet project objectives, while minimizing environmental
41 impacts, with the knowledge that additional engineering refinements, preliminary findings about
42 key environmental impacts, and input from the public and other interested parties may result in

1 future changes. The screening criteria were developed based specifically on the proposed project
2 presented in the NOP and are consistent with the legal requirements of CEQA and the project
3 objectives described in the NOP.

4 The following sections explain the criteria and how they were applied, which is followed by the
5 results. Table 3A-4 in Section 3A.4, *EIR Alternatives Screening Criteria*, illustrates how all the
6 alternatives met the two levels of screening described in the following sections.

7 **3A.4.1 First-Level Screening – Alternative Meets Most of the** 8 **Project Purpose and Objectives**

9 Under CEQA, a potentially feasible alternative would “feasibly attain *most* of the basic objectives of
10 the project” (emphasis added). The Delta Conveyance Project alternatives described in Section 3A.3,
11 *Identification of Alternatives under CEQA*, were combined into similar groups for screening and
12 screened against the project objectives (yes or no) to determine whether they would be carried
13 forward to the next level of screening. Because there are four criteria under the first filter, those
14 alternatives that met even two of the four criteria were allowed to move to the second filter. Those
15 alternatives were then assessed for whether they met Filter 2 (yes or no). Alternatives that passed
16 both filters were carried forward for analysis in the Draft EIR. Table 3A-1 shows the project
17 objectives associated with the criteria for two screening filters.

1 **Table 3A-1. Screening Filter Criteria and Project Objectives**

Criteria	Project Objective
Filter 1	
Climate resiliency. Addresses anticipated sea level rise and other reasonably foreseeable consequences of climate change and extreme weather events.	Address anticipated rising sea levels and other reasonably foreseeable consequences of climate change and extreme weather events.
Seismic resiliency. Minimizes health/safety risk to public from earthquake-caused reductions in water delivery quality and quantity from the SWP.	Minimize the potential for public health and safety impacts from reduced quantity and quality of SWP water deliveries south of the Delta resulting from a major earthquake that causes breaching of Delta levees and the inundation of brackish water into areas in which the existing SWP pumping plant operates in the southern Delta.
Water supply reliability. Restores and protects ability of the SWP to deliver water in compliance with regulatory and contractual constraints.	Protect the ability of the SWP to deliver water when hydrologic conditions result in the availability of sufficient amounts, consistent with the requirements of state and federal law, including the ESA, CESA, and Delta Reform Act, as well as the terms and conditions of water delivery contracts and other existing applicable agreements.
Operational resiliency. Provides operational flexibility to improve aquatic conditions and manage future regulatory constraints.	Provide operational flexibility to improve aquatic conditions in the Delta and better manage risks of further regulatory constraints on SWP operations.
Filter 2	
Avoids or lessens potentially significant environmental impacts more than the proposed project.	-

2 CESA = California Endangered Species Act; ESA = federal Endangered Species Act; SWP = State Water Project; CVP =
3 Central Valley Project.

4 A “yes” or “no” answer to the Filter 1 criteria was based on how well the alternative could meet
5 project objectives compared to the proposed project, as well as regulatory, cost, technological,
6 health and safety, and logistical considerations. An alternative had to meet at least two of the four
7 criteria and also had to be feasible to be carried forward for further analysis.

8 **3A.4.1.1 Criterion 1 – Climate Resiliency**

- 9 • Could the potential alternative address SWP water reliability challenges anticipated from rising
10 sea levels and other reasonably foreseeable consequences of climate change and extreme
11 weather events?

12 Climate change is expected to cause rising sea levels and altered patterns of precipitation. Either of
13 these effects, or both combined, would affect salinity in the Delta and potentially affect the
14 distribution, behavior, and lifecycles of aquatic species, which in turn would affect water supply
15 reliability for the SWP. Water conveyance facilities must be prepared to adapt operations to
16 continue to reliably deliver water under changing conditions.

17 Climate change poses a threat to the existing SWP. Maintaining the ability to continue SWP
18 operations in the face of sea level rise and unpredictable precipitation patterns is why climate
19 resiliency is one of the screening criteria.

1 Dual conveyance alternatives (i.e., alternatives that added an additional point of diversion to the
2 existing points of diversion for the SWP) were initially rated “yes” on this criterion because they
3 allowed for the SWP to divert water in new locations in addition to the existing SWP southern Delta
4 points of diversion during times of higher salinity conditions that could result from sea level rise or
5 reduced flows. The rating, however, was tied to the location of the new diversion; for example, a new
6 diversion facility in the west Delta area would not be able to satisfy this objective because, farther
7 downstream and more influenced by the ocean, it would have limited ability to adjust to changes in
8 sea level and resulting increases in salinity. Isolated facilities with diversions in the north Delta,
9 instead of existing export facilities, might meet this criterion because, farther upstream, a north
10 Delta diversion would have greater ability to adjust to changes in sea level rise and resulting
11 increases in salinity. Alternatives that exclusively use the existing south Delta facilities (i.e., through-
12 Delta and alternate supplies) and alternatives with new diversions in the west Delta would have
13 limited resiliency against future sea level rise and higher salinity levels and would not provide the
14 climate resiliency necessary to maintain a reliable water supply.

15 **3A.4.1.2 Criterion 2 – Seismic Resiliency**

- 16 • Could the potential alternative minimize the potential for public health and safety impacts from
17 reduced quantity and quality of SWP water deliveries south of the Delta resulting from a major
18 earthquake that causes breaching of Delta levees and the inundation of brackish water into the
19 areas in which the SWP pumping plant operates in the south Delta?

20 The current water system utilizes natural channels within the Delta to convey water in an area that
21 is extremely vulnerable to large seismic events. The Delta is a region of moderate seismic hazard,
22 with hazard generally increasing from east to west (e.g., Deverel et al. 2016:13). Contributions to
23 Delta seismic hazard come from faults near or within the Delta (e.g., Midland, Pittsburg Kirby Hills)
24 capable of producing moderate-magnitude earthquakes and, from more distant faults (e.g., San
25 Andreas, Hayward), capable of producing large earthquakes. Delta levees on Bacon Island, Webb
26 Tract, Venice Island, and King Island have been damaged by moderate-magnitude earthquakes close
27 to the Delta (e.g., M5.9 1980 Livermore earthquake and M6.7 1983 Coalinga earthquake witnessed
28 by workers on the levee on Webb Tract; Finch 1985:40–42). However, it has been more than 100
29 years since the large 1906 San Francisco earthquake. At that time, the Delta levees were relatively
30 modest in size, with little to no land subsidence behind them, and roughly only 50% of the islands
31 had been “reclaimed” (State of California 1991). It was speculated that the 1906 San Francisco
32 earthquake may have weakened Delta levees, even with their relatively low heights, and contributed
33 to the failure of 53 major islands during the wet winter of 1907 (Prokopovitch 1985). In 2014, the
34 U.S. Geological Survey estimated that a large earthquake of magnitude 6.7 or greater has a 72%
35 probability of occurring in the San Francisco Bay Area by 2043 (U.S. Geological Survey 2016:1). No
36 such prediction has been developed for the faults near or within the Delta. Seismic activity is one of
37 the most significant hazards that could cause a levee breach. Levee failure (e.g., a levee breach) could
38 cause catastrophic flooding, potentially causing injury or loss of life, and possibly damaging
39 property, water supply, infrastructure, and environmental resources of importance to the entire
40 state. In the case of a levee failure, water from the surrounding area would rush in to fill the interior
41 of the island, causing a suction effect that would draw saltier water from the Bay into the Delta.
42 These conditions would make water in the west Delta (and areas near the levee failure) saltier, and
43 this water may not be usable as a water supply until the salinity is flushed out.

44 This screening criterion requires that an alternative be able to protect the continued operation of
45 the SWP against a large seismic event, similar to the proposed project.

1 In general, alternatives that included new conveyance facilities that were not located in the west
2 Delta and rely on existing facilities were rated “yes.” New facilities proposed in the west Delta could
3 be designed to withstand seismic loads as DWR proposes for the central, eastern, or Bethany
4 Reservoir alignments. Alternatives that involved locating facilities in the west Delta were generally
5 rejected because the west Delta is closer to the Bay Area faults, and other faults underlie the area,
6 placing it at higher risk of damage from seismic shaking (Delta Stewardship Council 2017:27).
7 Additionally, these areas are more susceptible to the water quality concerns that would follow levee
8 failures that could be caused by seismic events because salinity intrusion would mean higher
9 salinities in the west Delta than farther inland. Through-Delta alternatives and alternate supplies did
10 not meet this criterion because they would rely only on existing south Delta facilities and provide no
11 alternate means of conveyance if seismic activity damaged or destroyed multiple levees and other
12 conveyance facilities. Alternatives did not meet this criterion if they increased risk of levee failure
13 through use of additional leveed waterways (e.g., the Deep Water Ship Channel).

14 **3A.4.1.3 Criterion 3 – Water Supply Reliability**

- 15 • Could the potential alternative protect the ability of the SWP to reliably deliver water, when
16 hydrologic conditions result in the availability of sufficient amounts, consistent with the
17 requirements of state and federal law, including the CESA, ESA, and Delta Reform Act, as well as
18 the terms and conditions of water delivery contracts and other existing applicable agreements?

19 Although drought, flood, climate change, and earthquakes all pose a threat to the water system,
20 more immediate effects on the reliability of SWP supplies conveyed through and diverted from the
21 Delta are current pumping limitations in the south Delta in compliance with water quality and
22 federal and state endangered species requirements. These pumping restrictions could prevent the
23 SWP from reliably capturing water when it is available, especially from storm events. Despite
24 cultivating alternative water sources, the SWP remains an important source of water for two-thirds
25 of Californians and hundreds of thousands of acres of farmland that receive water from the SWP
26 south-of-Delta. For that reason, any alternative to the proposed project must be able to provide
27 water, in accordance with the terms of water delivery contracts, while still complying with all
28 applicable regulatory requirements currently in place.

29 The following sections explain the criteria and how they were applied, which is followed by
30 information about the results. Generally, dual conveyance alternatives were rated “yes” for this
31 criterion because multiple diversion locations and conveyance systems (e.g., new intakes and
32 conveyance alignment and continued use of south Delta diversion facilities) would maximize
33 opportunities for water conveyance while still complying with applicable regulations.

34 **3A.4.1.4 Criterion 4 – Operational Resiliency**

- 35 • Could the potential alternative provide operational flexibility for the SWP to improve aquatic
36 conditions and manage future regulatory constraints?

37 The SWP must operate in compliance with regulatory constraints that protect aquatic species and
38 water quality under dynamic conditions.

39 Given current and anticipated future environmental conditions, DWR must prepare for events that
40 could further restrict current SWP operations or unexpectedly inhibit continued use of the current
41 SWP water conveyance system. For that reason, this criterion screens for alternatives that offer

1 flexibility in how the system can be operated in real time to address existing and aquatic species and
2 water quality concerns.

3 Dual conveyance alternatives that provide another location for the SWP to divert water when
4 existing regulations prevented operations at the existing south Delta facilities were generally rated
5 “yes.” The flexibility to alter operations in this way allows greater certainty that SWP can deliver its
6 obligations reliably. However, dual conveyance alternatives that included new diversion facilities
7 near sensitive resource areas were considered less likely to provide this flexibility because the new
8 diversion facilities also could not be operated reliably in those cases. Isolated and through-Delta
9 conveyance alternatives, or those that abandon south Delta facilities, did not provide such
10 operational flexibility and generally were rejected.

11 **3A.4.1.5 First-Level Screening Results**

12 The initial screening eliminated the following alternatives because they did not meet two or more of
13 the Filter 1 screening criteria, as shown in Table 3A-2.

14 **Table 3A-2. Alternatives Eliminated at First-Level Screening**

Alternative	Reasons for Elimination (criteria not met)
Dual Conveyance with New Intakes at Decker Island	<ul style="list-style-type: none"> • Climate resiliency. <ul style="list-style-type: none"> ○ During July through November, there is relatively high salinity in the west Delta where Decker Island is located, which would reduce the ability for SWP diversions, especially as sea level rise progresses, which results in even greater salinity intrusion. Therefore, total water deliveries would be less than alternatives without western Delta intakes, in light of anticipated climate change. ○ Sea level rise is anticipated to be greater in the western Delta than further upstream in the north Delta due to river flows and channel geometry; therefore, the facility could be required to be modified structurally as sea level rise progresses. As the sea level rises, less land may be available for the fish screen due to the angle of the levee, and the total length of the fish screen could exceed available land. • Seismic resiliency. Intakes in the west Delta at Decker Island would be subject to seismic risk due to the proximity of faults near Suisun Bay. A west Delta intake location is more vulnerable to being shut down by an earthquake due to salinity intrusion than the existing SWP south Delta point of diversion. Additionally, an intake at this location would be at a higher risk of damage from a tsunami resulting from seismic activity. • Operational resiliency. Use of the intakes at Decker Island would be less reliable than the existing south Delta intake location due to proximity to high salinity waters and/or presence of Delta smelt in some months; this alternative potentially would increase the reliance on the existing south Delta intakes, which would continue to be limited due to water quality and ESA regulations. • Water supply reliability. Limited ability to divert water in the western Delta near Decker Island because of the presence of Delta smelt, resulting in low water supply reliability. A pilot study completed by the Bay Area Regional Desalination Project in March 2010 for a desalination facility with a diversion in Mallard Slough, which is located 10 miles further west of Decker Island in the west Delta, indicated that, during operations of a 25-million-gallons-per-day intake (approximately 40 cfs) from November 2008 through October 2009, prickly sculpin (<i>C. asper</i>), bluegill (<i>Lepomis macrochirus</i>), redear sunfish

Alternative	Reasons for Elimination (criteria not met)
	<p>(<i>Lepomis microlophus</i>), longfin smelt, and delta smelt were entrained. Longfin smelt and delta smelt were entrained during January through June. Presence of these species in the western Delta during the period when high flows would occur in the Sacramento River could reduce the effectiveness of a western Delta intake. During July through November, salinity could be too high for diversions from the western Delta, especially as sea level rise progresses.</p> <ul style="list-style-type: none"> ● Other considerations: <ul style="list-style-type: none"> ○ Delta smelt are much more likely to occur near Decker Island than in the Sacramento River near Hood (proposed project intake locations). Decker Island is in the main distribution of delta smelt, so that small life stages (e.g., larvae) would be vulnerable to entrainment at this location (Murphy and Hamilton 2013). Even though screens at any location would exclude delta smelt greater than ~21 millimeters in size, potential negative effects, including entrainment and impingement, would be more likely to occur at intakes near Decker Island, creating a significant impact to aquatic special-status species.
Dual Conveyance Tunnel with New Intakes at Fremont Weir and Decker Island	<ul style="list-style-type: none"> ● Due to involvement of a Decker Island intake, this alternative does not meet the Filter 1 criteria of climate resiliency, seismic resiliency, operational resiliency, or water supply reliability for the same reasons as Dual Conveyance with new intakes at Decker Island, above. ● Water supply reliability. Alternatives with a Fremont Weir intake were evaluated in 2010 during development of the BDCP. Results of a preliminary evaluation during that time indicated that diversions upstream of American River probably would not occur until the flows were greater than 5,000 cfs, due to the need to provide water to diversions located between the Feather and American Rivers (including over 200,000 acre-feet/year of water rights or CVP water rights settlement contracts with Natomas Central Mutual Water Company, the cities of West Sacramento, Davis, Woodland, and Sacramento, and several reclamation districts). The preliminary evaluation indicated that these types of restrictions and the inability to divert water from the American River could reduce the amount of diversions from the Sacramento River by 30% as compared to intakes located downstream of the American River, including at the existing south Delta diversions, resulting in lack of water supply reliability. ● Other considerations: <ul style="list-style-type: none"> ○ North Delta diversions upstream of Freeport (including at the Fremont Weir) would reduce the operational flexibility of the wastewater treatment plant and the Freeport Regional Water Authority intake.
Isolated Conveyance Tunnel with New Intakes at Fremont Weir and Decker Island	<ul style="list-style-type: none"> ● Due to involvement of Decker Island and Fremont Weir intakes, it does not meet the Filter 1 criteria of climate resiliency, seismic resiliency, operational resiliency, or water supply reliability for the same reasons as Dual Conveyance with new intakes at Fremont Weir and Decker Island, above. ● Water supply reliability. An isolated conveyance tunnel alternative would provide less water supply reliability than existing SWP south Delta diversions, due to the need to rely solely on intakes at Fremont Weir and Decker Island. This alternative likely would experience more limited operations than the existing south Delta point of diversion due to the need to maintain Sacramento River flow at Freeport and water quality and the need to protect Delta smelt near Decker Island, described above. ● Operational resiliency. Isolated conveyance options would not allow for operational resiliency due to abandonment of south Delta intakes.

Alternative	Reasons for Elimination (criteria not met)
Isolated Conveyance with San Joaquin River Intake (and desalination facilities)	<ul style="list-style-type: none"> ● Climate resiliency. Sea level rise is anticipated to be greater in the west Delta than farther upstream in the north Delta or at the existing south Delta diversions. Therefore, the facility could be required to be modified structurally as sea level rise progresses. ● Seismic resiliency. Intakes in the west Delta near Antioch would be subject to seismic risk due to the proximity of faults near Suisun Bay. A west Delta intake location is more vulnerable to being shut down by an earthquake due to salinity intrusion than the existing SWP south Delta point of diversion. Additionally, an intake at this location would be at a higher risk of damage from a tsunami resulting from seismic activity. ● Operational resiliency. Isolated conveyance options would not allow for operational resiliency, due to abandonment of south Delta intakes. ● Other considerations: <ul style="list-style-type: none"> ○ Climate resiliency could be affected for Central California due to increased GHG emissions related to energy requirements needed for desalination facilities near the Antioch or Pittsburg intakes. With sea level rise in the future, salinity would increase in the lower San Joaquin River and would require increased use of the desalination facilities.
Western Delta Intake Concept	<ul style="list-style-type: none"> ● Climate resiliency. The alternative proposed use of Sherman Island as an intake forebay; however, because the sea level rise is anticipated to be greater in the west Delta than farther upstream in the north Delta (due to river flows and channel geometry), the facility could be required to be modified structurally as sea level rise progresses. ● Seismic resiliency. Intakes in the west Delta at Sherman Island would be subject to seismic risk due to the proximity of faults near Suisun Bay. A west Delta intake location is more vulnerable to being rendered unusable by an earthquake due to salinity intrusion than the existing SWP south Delta point of diversion. Additionally, a new intake forebay at this location would be at a higher risk of severe damage from seismic activity or a tsunami resulting from seismic activity. ● Water supply reliability. The alternative would likely result in limited use of the west Delta intake due to the presence of high-salinity waters near Sherman Island. This issue would become exacerbated over time with sea level rise and climate change because salinity moves further into the Delta in dry conditions. Additionally, Delta water quality may limit the use of the Sherman Island reservoir. Sherman Island is located at approximately 57 miles from the Golden Gate. This alternative indicates that diversions would not occur unless X2 is located “well west of Sherman Island.” Generally, X2 is located near Chipps Island (46 miles from the Golden Gate) to provide freshwater to the west Delta intakes. Under existing conditions, X2 would be located at or to the west of Chipps Island all or most of the time in January through June of wet and above-normal water years, the majority of the time in January through May in below-normal water years, and February through April of dry years. In other periods and water year types during January–June, X2 would only occasionally be at or west of Chipps Island. Also, because water would be diverted at Sherman Island, the X2 location would move eastward unless additional water is released from upstream reservoirs. Therefore, diversions would be limited near Sherman Island. Even though the existing south Delta intakes would continue to be in use, ongoing regulatory restrictions would still be in place. Due to the limitations of diversions near Sherman Island and diversions at the south Delta intakes, the goal of water supply reliability would not be achieved. ● Other considerations:

Alternative	Reasons for Elimination (criteria not met)
	<ul style="list-style-type: none"> ○ The alternative proposes installation of fish screens along Old River at the entrance to Clifton Court Forebay. More than 60 studies have been completed by DWR in the past 30 years to evaluate the feasibility of providing fish screens along the intakes to Clifton Court Forebay. These studies have indicated that it is difficult to find a location at the Clifton Court Forebay site for a single location that would provide appropriate sweeping velocities to reduce the entrainment of fish in accordance with USFWS and NMFS fish screen operations criteria or guidance. The screen would have to be more than a mile in length, which could expose fish to excessive times in front of the screen. Because the screens are located in short sloughs with limited cross-waterways, the fish could accumulate in front of the screens and be subject to predation, poor habitat quality, or increased potential of entrainment at the Clifton Court Forebay screens and other intakes in the adjacent portions of the south Delta. ○ Water quality could be difficult to maintain in the Sherman Island Forebay in the summer. During the summer and fall months, west Delta salinity near Sherman Island could range from 500 to over 2,000 micromhos per centimeter. The saline water could migrate through the groundwater into the Sherman Island Forebay. This would be more likely if the volume of stored water is low. The potential for migration from the Delta into Sherman Island also would be more likely under this potential alternative as compared to the existing conditions because of the removal of up to 45 feet of peat soils. ○ The alternative calls for permeable levees to allow water to enter Sherman Island, while avoiding or reducing fish entrainment. Although, in concept, the reduction in entrainment is an excellent feature, the construction of the proposed levees likely would be impractical. Levee designs that include rock and sand to reduce fish entrainment in the facilities are of limited use and success in a project this size. A permeable embankment capable of passing 15,000 cfs at a velocity of 0.002 feet per second (100 times less than existing approach velocity criteria) would have to be about 95 miles long (assuming 15 feet of wetted area). Sherman Island only has about 19.5 miles of existing levees. ○ Inundation of Sherman Island would create its own problems. Constructing a reservoir in the west Delta on peaty soils combined with more saline water would increase the potential formation of trihalomethanes for downstream municipal water users. Alternatively, should the peat soils be removed during construction, very substantial amounts of excavation, with attendant environmental impacts, would be necessary. Although the actual size of the Sherman Island Forebay has not been described, it would need to be at least several hundred acres to provide an operational buffer and take advantage of off-peak pumping. At some locations on Sherman Island, the peat can be up to 40 feet deep. Assuming the forebay size to be 750 acres and the average depth of peat to be 20 feet, removal of over 653 million cubic yards would be required.
SolAgra Water Solution Alternative	<ul style="list-style-type: none"> ● This alternative would not meet the criteria of climate resiliency and seismic resiliency for the same reasons as the Western Delta Intake Concept because it would also rely on Sherman Island in the western Delta. ● Operational resiliency. This alternative would end the use of Banks Pumping Plant. Isolated conveyance options would not allow for operational resiliency due to abandonment of south Delta intakes.
Portfolio-Based Proposal	<ul style="list-style-type: none"> ● Water supply reliability. This alternative has the specific goal of reducing SWP exports, which is antithetical to the water supply reliability criteria (i.e.,

Alternative	Reasons for Elimination (criteria not met)
including Water Conveyance Facilities	<p>restoring and protecting the ability of the SWP to deliver water). The proposal specifically limits the north Delta diversion project design capacity to 3,000 cfs and assumes reduced south Delta diversions during the summer months. This alternative estimates that total south-of-Delta diversions from the SWP and CVP would be 4.0 to 4.3 million acre-feet/year (approximately half of existing SWP and CVP contractual agreements and water rights). The 4.0 to 4.3 million acre-feet/year includes approximately 1.3 million acre-feet/year to be delivered under existing water rights exchange agreements and federal criteria for refuge water supplies.</p> <ul style="list-style-type: none"> ● Seismic resiliency. Although this alternative proposes to improve Delta levees to reduce vulnerability of Delta water supplies to earthquakes, these actions would require extensive construction and result in substantial environmental impacts. It would be difficult and expensive to reconstruct all levees to meet water supply reliability goals. Additionally, the alternative provides limited seismic resiliency due to limited capacity at the north Delta diversion and associated water conveyance. If the existing SWP and CVP water supply conveyance through existing Delta channels were disrupted following levee failures after a seismic event, the available water supply from the north Delta diversion would be limited. ● Operational resiliency. Due to the fact that the alternative involves only one 3,000-cfs intake, there would be limited ability to divert water in the north Delta and primary dependence on south Delta intakes would remain in place. ● Other considerations: <ul style="list-style-type: none"> ○ This alternative does address alternative water supplies for all of the existing SWP and CVP south of the Delta users; however, due to a wide variety of geographical and hydrological conditions throughout the south-of-Delta area, not all local water demands and supplies could be modified to continue to support existing and future land uses with warmer temperatures (which would increase water demand of crops) and less rainfall (which would decrease local water supplies). ○ The scope of the Portfolio Approach is greater than can be encompassed in the proposed project objectives and includes efforts that are outside the control of DWR. The scope of this alternative is akin to a statewide water plan. DWR has no control over local water recycling and conservation, even with respect to the water agencies and water districts in California that receive SWP water from DWR, many of which are water wholesalers, and cannot control the actions of water retailers.
<p>Through-Delta Conveyance with No Diversion Facility</p> <ul style="list-style-type: none"> ● Western Delta Salinity Control Barrier ● 1957 DWR Evaluation of Salinity Control Barriers ● Eco-Crescent/Middle River Corridor Conveyance 	<ul style="list-style-type: none"> ● Water supply reliability. Due to sole reliance on existing south Delta diversions that could be further limited in the future, as species decline continues to be a concern, the fish agencies are likely to impose more constraints on south Delta operations on the theory that doing so is needed to meet no-jeopardy and fully mitigate standards under the ESA and CESA, respectively. ● Climate resiliency. The south Delta diversions are likely to become more limited in use as water quality at the diversions becomes more degraded as sea levels rise. ● Seismic resiliency. Potentially limited seismic resiliency of the salinity barriers due to the location of the barriers near several fault zones that extend north from the San Francisco Bay Area. Although water quality could be maintained in the central and south Delta if levees failed due to a seismic event, seismic resiliency of the south Delta diversion facilities would not necessarily

Alternative	Reasons for Elimination (criteria not met)
<ul style="list-style-type: none"> Separated Delta Corridors for Water Supply Conveyance and Fish Passage 	<p>be increased, and the SWP and CVP diversion facilities are located near the West Tracy Fault zone, which could cause damage.</p> <ul style="list-style-type: none"> Operational flexibility. Potential effects on operational flexibility would be unknown for alternatives with in-Delta corridor barriers, due to the unknown minimum flows to be included in the fish corridors to maintain adequate flows and avoid conditions that support predators, and in the water corridors to avoid flows that could cause operational issues with non-SWP/CVP diverters in the Delta.
<p>Through-Delta Conveyance with New Fish Handling Facilities at Clifton Court Forebay</p>	<ul style="list-style-type: none"> Climate resiliency. The incremental sea level rise would be higher at Clifton Court Forebay than at the upstream north Delta diversion locations due to river flows and channel geometry. At existing conditions, the fish screen could be more than 1 mile long. At higher water elevations, channel hydraulics and site conditions will change, and fish-protective facilities may not function well in this area. Such a fish screen or other potential fish screening strategies (e.g., screw traps, fish funnels) would ultimately be susceptible to all existing issues present for the current south Delta facilities. Additionally, the south Delta diversions are likely to become more limited in use as water quality at the diversions becomes more degraded as sea levels rise. Operational flexibility. This alternative would not provide operational flexibility due to sole reliance on existing south Delta diversions. The ability to use the south Delta diversions would become even more limited with time as the species decline and the fish agencies are likely to impose more constraints on south Delta operations. Water supply reliability. Due to sole reliance on existing south Delta diversions that could be further limited in the future, as the species decline, the fish agencies are likely to impose more constraints on south Delta operations on the theory that doing so is needed to meet no-jeopardy and fully mitigated standards under the ESA and CESA, respectively. No improvement in seismic resiliency due to the continuous need for improvement of levees, including increased height to maintain flood management with sea level rise and climate change conditions. In addition, the SWP and CVP diversion facilities are located near the West Tracy Fault zone, which could cause damage. With no alternate means of conveyance in the event of a seismic disruption, this alternative would not meet seismic resiliency criteria.
<p>Portfolio Approach without New Water Conveyance Facilities</p>	<ul style="list-style-type: none"> Climate resiliency. The south Delta diversions are likely to become more limited in use as water quality at the diversions becomes more degraded as sea levels rise. Water supply reliability. This alternative proposes that demands in the SWP service area be addressed through conservation and alternative water supplies. However, this does not address the fundamental project objective of restoring and protecting the ability of the SWP, and potentially the CVP, to deliver water. Seismic resiliency. Although this alternative proposes to improve Delta levees to reduce vulnerability of Delta water supplies to earthquakes, these actions would require extensive construction and result in substantial environmental impacts. It would be difficult and expensive to reconstruct all levees to meet water supply reliability goals. The existing south Delta diversion facilities are located near the West Tracy Fault zone, which could cause damage. Without north Delta diversions included in this alternative, disruption of the south Delta diversions would reduce SWP and/or CVP water deliveries south of the Delta.

Alternative	Reasons for Elimination (criteria not met)
	<ul style="list-style-type: none"> ● No operational resiliency for the SWP to improve aquatic conditions and manage future regulatory constraints because this alternative would retain sole dependence on south Delta intakes. ● Other considerations: <ul style="list-style-type: none"> ○ The scope of the Portfolio Approach is greater than can be encompassed in the proposed project objectives and includes efforts that are outside the control of DWR. The Portfolio Approach is more akin to a statewide water plan that would treat areas receiving water from the Delta as a single water-planning unit and include an approach to increase water-use efficiency and water supplies. ○ Improvement of the SWP and CVP conveyance facilities to reduce water leaks, provide for electricity generation, and improve water delivery efficiencies are being addressed in ongoing and future operations and maintenance projects that include not only the water entities involved in the Delta Conveyance Project, but also other SWP or CVP water users.
<p>Integration of Water Conveyance with Other Projects</p>	<ul style="list-style-type: none"> ● Operational resiliency. These proposals would continue to rely solely on use of the existing south Delta diversions to deliver SWP supplies. ● Climate resiliency. The south Delta diversions are likely to become more limited in use as water quality at the diversions becomes more degraded as sea levels rise. ● Seismic resiliency. Although this alternative proposes to improve Delta levees to reduce vulnerability of Delta water supplies to earthquakes, these actions would require extensive construction and result in substantial environmental impacts. It would be difficult and expensive to reconstruct all levees to meet water supply reliability goals. The existing south Delta diversion facilities are located near the West Tracy Fault zone, which could cause damage. Without north Delta diversions included in this alternative, disruption of the south Delta diversions would reduce SWP and/or CVP water deliveries south of the Delta. ● These options would not provide any water supply reliability in that they do not protect the ability of the SWP to deliver water. ● Other considerations: <ul style="list-style-type: none"> ○ This set of concepts includes some items that would require extensive integration and coordination with other agencies or entities, including barges with desalination treatment facilities in the Pacific Ocean or bays near Monterey or Los Angeles and conveyance to water users or interconnection between water supply entities that use and do not use SWP or CVP water supplies. At this time, it is unknown whether these concepts could be permissible for construction or operations, and, even if permissible, they likely would result in lengthy approval processes. Thus, in addition to the issues identified above, they are speculative. <p>Other proposals would need to be coordinated with other water project alternatives, such as inclusions of microhydropower equipment in the tunnels, reconnection of Delta channels, closure of Delta Cross Channel gates, and increased upstream storage. Therefore, the ability to increase climate resiliency, seismic resiliency, water supply reliability, and operational resiliency would be dependent upon those conveyance alternatives.</p>

1 BDCP = *Bay Delta Conservation Plan*; CESA = California Endangered Species Act; cfs = cubic square feet; CVP = Central
2 Valley Project; DWR = California Department of Water Resources; ESA = Federal Endangered Species Act; GHG =
3 greenhouse gas; NMFS = National Marine Fisheries Service; SWP = State Water Project; USFWS = U.S. Fish and
4 Wildlife Service.

5 ¹ Permeable levees can be constructed based on various designs. Those that include rock and sand as to reduce fish
6 entrainment in the facilities are of limited use and success in a project this size.

The remaining alternatives to the proposed project presented in the NOP passed Filter 1 and were further screened at Filter 2, as shown in Section 3A.4.2.1, *Second-Level Screening Results*. The remaining alternatives are:

- Dual Conveyance East Canal
- Dual Conveyance West Canal
- Dual Conveyance with New Intakes at Sacramento Weir
- Dual Conveyance Bethany Alignment
- Isolated Conveyance Tunnel with Sacramento River Intakes
 - Isolated Conveyance West Canal with Sacramento River Intakes
 - Isolated Conveyance East Canal with Sacramento River Intakes
 - Isolated Conveyance East Canal with Feather River Intakes
- Alternative Locations for Diversion Facilities Along the Sacramento River in North Delta

3A.4.2 Second-Level Screening – Alternative Avoids or Substantially Lessens Impacts Compared to the Proposed Project

The second-level screening criterion focuses on the potential to avoid or reduce potential adverse environmental effects of the proposed project. Alternatives were considered for their ability to avoid or reduce land based impacts, impacts related to fill activities, or reduce impacts on waters of the United States.

3A.4.2.1 Second-Level Screening Results

Table 3A-3 shows the alternatives that were eliminated because they failed to avoid or substantially lessen environmental impacts. For details about how the intake sites were considered and screened out, see Attachment A to the Engineering Project Reports (Delta Conveyance Design and Construction Authority 2022b, 2022c). Only the dual conveyance Bethany Reservoir alignment passed the Filter 2 screening for its potential to avoid or reduce impacts compared to the proposed project in the NOP and is evaluated in the EIR as Alternative 5.

Table 3A-3. Results of Second-Level Screening

Alternative	Reasons for Elimination
Dual Conveyance East Canal	<ul style="list-style-type: none"> • A canal would have greater impacts on land use, agricultural operations, and multiple other resources than the proposed project, which would include a tunnel that would be constructed underground with tunnel shafts every 4 to 6 miles. The canal width would be approximately 1,400 feet between the outside levee toes. The canal would be constructed with levees that would extend above the ground surface, so that the bottom of the canal could be constructed above the normal groundwater elevations. • Additionally, as analyzed in the BDCP/California WaterFix EIR/EIS (California Department of Water Resources 2016b:12-7, 12-1402, 12-2037, 12-2762), because a canal is a surface impact, it negatively would affect more wetlands and waters of the United States than the proposed project, which would only affect

Alternative	Reasons for Elimination
	land surfaces at the tunnel shafts (every 4 to 6 miles) and would not require culverts constructed under water bodies as compared to a canal.
Dual Conveyance West Canal	<ul style="list-style-type: none"> • Same as Dual Conveyance East Canal alternative.
Dual Conveyance with New Intakes at Sacramento Weir	<ul style="list-style-type: none"> • The tunnel would require tunnel shafts near residential and commercial areas close to the communities of West Sacramento, Freeport, Clarksburg, and Hood. • The Sacramento Weir is an important flood control feature. Its primary purpose is to protect the City of Sacramento from excessive flood stages in the Sacramento River by diverting river flows west into the 2-mile-long Sacramento Bypass. Intakes at this location would affect the ability of the Sacramento Weir and Bypass to provide flood control support by reducing the amount of water passing over the weir and into the bypass. Additionally, intakes constructed near the Sacramento Weir would have the potential to affect the Sacramento Bypass, which is predominantly riparian and grasslands.
Isolated Conveyance Tunnel with Sacramento River Intakes	<ul style="list-style-type: none"> • Elimination of use of the south Delta diversions would reduce the amount of freshwater flows from the Sacramento River through Delta Cross Channel gates and Mokelumne River systems and convey across the San Joaquin River to the south Delta channels and freshwater reverse flows from the lower Sacramento and San Joaquin Rivers into the south Delta channels. • This alternative is more impactful than dual conveyance options, where fresh water would still be conveyed north to south through the Delta, which keeps the water fresher than it otherwise would be.
Isolated Conveyance West Canal with Sacramento River Intakes	<ul style="list-style-type: none"> • A canal would have greater land use conflicts, as well as impacts on agricultural operations and multiple other resources, than the proposed project, which would include a tunnel that would be constructed underground with tunnel shafts every 4 to 6 miles. The canal width would be approximately 1,400 feet between the outside levee toes. The canal would be constructed with levees that would extend above the ground surface so that the bottom of the canal could be constructed above the normal groundwater elevations. • Additionally, as analyzed in the BDCP/WaterFix EIR/EIS (California Department of Water Resources 2016b), because a canal is a surface impact, it would affect more wetlands and waters of the United States than the proposed project which would only affect land surfaces at the tunnel shafts (every 4 to 6 miles) and would not require culverts constructed under water bodies as compared to a canal. • This alternative is more impactful than dual conveyance options, where fresh water would still be conveyed north to south through the Delta, which keeps the water fresher than it otherwise would be.
Isolated Conveyance East Canal with Sacramento River Intakes	<ul style="list-style-type: none"> • Same as Isolated Conveyance West Canal with Sacramento River Intakes.
Isolated Conveyance East Canal with Feather River Intakes	<ul style="list-style-type: none"> • This alternative would include an additional 150-mile-long canal from the lower Feather River that would extend to the Lower American River and Lower Stanislaus River. This canal would extend through primarily agricultural lands, except near Sacramento and Stockton. Thus, it would have even greater impacts on natural and cultural resources at or near the surface of the land than would the canal alternatives, discussed above. • Water from the Feather River (diverted above the confluence with the Sacramento River) would be discharged into the lower American River and

Alternative	Reasons for Elimination
A Water Plan for All of California	<p data-bbox="505 235 1382 323">Stanislaus River and could affect the ability of fish to determine appropriate attraction flow with chemical constituents to improve fish migration to native streams.</p> <ul style="list-style-type: none"> <li data-bbox="477 331 1390 420">• An isolated conveyance alternative is more impactful than dual conveyance options, where fresh water would still be conveyed north to south through the Delta, which keeps the water fresher than it otherwise would be.
	<ul style="list-style-type: none"> <li data-bbox="477 436 1406 525">• Construction vehicle traffic to access the site and construction-related noise and air emissions would be concentrated in a populated urban area with six schools and other sensitive receptors along routes and near construction sites. <li data-bbox="477 533 1382 621">• The southern end of the Deep Water Ship Channel has a substantial amount of riparian area that would be disturbed by construction of the intakes and ship lock. <li data-bbox="477 630 1416 814">• Proposed fish screen and low head-pump station at the existing opening to the Deep Water Ship Channel on the Sacramento River (i.e., Port of West Sacramento intake) would not reduce environmental and other impacts compared to the proposed project. The location is subject to high sediment deposition and would require more dredging during operations as compared to the intakes within the proposed project. <li data-bbox="477 823 1377 911">• Based upon previous studies by the USACE, some of the sediment in the Deep Water Ship Channel would include hazardous materials and could require sealing within the channel. <li data-bbox="477 919 1406 1071">• An on-bank vertical plate screen structure would require the screen to be in the main channel of the river, where it would be across from the Miller Park boat entrance and in a fairly narrow section of the river, which presents a potential navigation hazard compared to construction of an “in bank” design (as is proposed for the proposed project). <li data-bbox="477 1079 1409 1197">• An in-channel (i.e., chevron configuration) vertical plate screen would require fish capture and handling, which is not a preferred protection measure for endangered aquatic species. Regulatory approval is typically limited to locations with no other alternatives, which is not the case here. <li data-bbox="477 1205 1393 1293">• This alternative would conflict with the adopted <i>West Sacramento General Plan</i> for development adjacent to the Deep Water Ship Channel near the confluence with the Sacramento River. <li data-bbox="477 1302 1416 1421">• The western levee of the Deep Water Ship Channel would be modified to provide flood management protection and seismic protection for the facilities. This would require construction activities within the Yolo Bypass Wildlife Area that would adversely affect biological resources.

1 BDCP = *Bay Delta Conservation Plan*; EIR = environmental impact report; EIS = environmental impact statement;
2 USACE = U.S. Army Corps of Engineers.

1 **3A.4.3 Alternatives Selected for Analysis in the Final EIR**

2 Based on the Filter 1 and Filter 2 screenings described above, nine alternatives (including the
3 proposed project) were selected for analysis in this Final EIR because they meet project objectives
4 for climate resiliency, seismic resiliency, water supply reliability, and operational resiliency and
5 would avoid or substantially lessen environmental impacts compared to the other projects
6 screened, as presented in Tables 3A-2 and 3A-3. The Bethany Reservoir alignment is the only
7 alternative to the project proposed in the NOP that would meet criteria in both Filter 1 and Filter 2
8 (Table 3A-4). The central and eastern alignments, as originally proposed with a range of conveyance
9 capacities, are evaluated as Alternatives 1, 2a, 2b, 2c, 3, 4a, 4b, and 4c in this Final EIR. The Bethany
10 Reservoir alignment is evaluated as Alternative 5.

11 The basis of the Bethany Reservoir alignment was described above in Section 3A.3.1.8, *Dual*
12 *Conveyance Bethany Reservoir Alignment*. Compared to the proposed project described in the NOP,
13 the dual conveyance Bethany Reservoir alignment would eliminate the need for the Southern
14 Forebay and the Southern Complex entirely, including any need for realignment of Byron Highway
15 and Franklin Boulevard, and modifications of railroad tracks at Twin Cities Complex and Southern
16 Complex. This alternative would avoid the impacts of constructing the Southern Complex, which
17 would have the potential for agricultural, aesthetic, noise, and air quality effects from increased
18 traffic that could affect sensitive receptors at the town of Discovery Bay.

19 The dual conveyance Bethany Reservoir alignment would provide the same climate resiliency,
20 seismic resiliency, and water supply reliability as the central and eastern alignment alternatives
21 evaluated in the Final EIR and potentially would have fewer or substantially reduced environmental
22 impacts. Additionally, this alternative could have better operational resiliency than the proposed
23 project because it is independent of Banks Pumping Plant. The new facilities from intakes to the
24 southern end of this alternative would be built to meet current seismic design standards.

1 **Table 3A-4. Alternatives Screening Matrix**

	Filter One – Project Objectives					Filter Two	
	Climate Resiliency	Seismic Resiliency	Water Supply Reliability	Operational Resiliency	Yes/No	Avoids or Substantially Lessens Impacts	Yes/No
	Addresses anticipated sea level rise and other reasonably foreseeable consequences of climate change and extreme weather events	Minimizes health/safety risk to public from earthquake-caused reductions in water delivery quality and quantity from the SWP	Restores and protects ability of the SWP to deliver water in compliance with regulatory and contractual constraints	Could provide operational flexibility for the SWP to improve aquatic conditions and manage future regulatory constraints	Meets at least two objectives	Will the alternative result in fewer or lesser environmental impacts than the proposed project or other alternatives?	
Dual Conveyance Central Tunnel (NOP proposed project)	Y	Y	Y	Y	Y	Y	Y
Dual Conveyance Eastern Tunnel (NOP proposed project)	Y	Y	Y	Y	Y	Y	Y
Dual Conveyance East Canal	Y	N	Y	Y	Y	N	N
Dual Conveyance West Canal	Y	N	Y	Y	Y	N	N
Dual Conveyance with New Intakes at Sacramento Weir	Y	Y	Y	Y	Y	N	N
Dual Conveyance Tunnel with New Intakes at Fremont and Decker Island	N	N	N	N	N	-	-
Dual Conveyance with New Intakes at Decker Island	N	N	N	N	N	-	-

	Filter One – Project Objectives					Filter Two	
	Climate Resiliency	Seismic Resiliency	Water Supply Reliability	Operational Resiliency	Yes/No	Avoids or Substantially Lessens Impacts	Yes/No
	Addresses anticipated sea level rise and other reasonably foreseeable consequences of climate change and extreme weather events	Minimizes health/safety risk to public from earthquake-caused reductions in water delivery quality and quantity from the SWP	Restores and protects ability of the SWP to deliver water in compliance with regulatory and contractual constraints	Could provide operational flexibility for the SWP to improve aquatic conditions and manage future regulatory constraints	Meets at least two objectives	Will the alternative result in fewer or lesser environmental impacts than the proposed project or other alternatives?	
Dual Conveyance Bethany Reservoir Alignment	Y	Y	Y	Y	Y	Y	Y
Isolated Conveyance New Intakes at Fremont Weir and Decker Island	N	N	N	N	N	-	-
Isolated Conveyance Tunnel with Sacramento River intakes	Y	N	Y	N	Y	N	N
Isolated Conveyance West Canal with Sacramento River Intakes	Y	Y	Y	N	Y	N	N
Isolated Conveyance East Canal with Sacramento River Intakes	Y	Y	Y	N	Y	N	N
Isolated Conveyance East Canal with Feather River Intakes	Y	Y	Y	N	Y	N	N

	Filter One – Project Objectives					Filter Two	
	Climate Resiliency	Seismic Resiliency	Water Supply Reliability	Operational Resiliency	Yes/No	Avoids or Substantially Lessens Impacts	Yes/No
	Addresses anticipated sea level rise and other reasonably foreseeable consequences of climate change and extreme weather events	Minimizes health/safety risk to public from earthquake-caused reductions in water delivery quality and quantity from the SWP	Restores and protects ability of the SWP to deliver water in compliance with regulatory and contractual constraints	Could provide operational flexibility for the SWP to improve aquatic conditions and manage future regulatory constraints	Meets at least two objectives	Will the alternative result in fewer or lesser environmental impacts than the proposed project or other alternatives?	
Isolated Conveyance with San Joaquin River intake	N	N	Y	N	N	-	-
A Water Plan for All of California	Y	Y	N	N	Y	N	N
Western Delta Intake Concept	N	N	N	Y	N	-	-
SolAgra Water Solution	N	N	Y	N	N	-	-
Portfolio-Based Proposed including Water Conveyance Facilities	Y	N	N	N	N	-	-
Through-Delta Conveyance No New Diversion Facility (with Barriers)	N	N	N	N	N	-	-
Through-Delta Conveyance with No New Diversion Facility – New Fish Handling Facilities at Clifton Court Forebay	N	N	N	N	N	-	-

	Filter One – Project Objectives					Filter Two	
	Climate Resiliency	Seismic Resiliency	Water Supply Reliability	Operational Resiliency	Yes/No	Avoids or Substantially Lessens Impacts	Yes/No
	Addresses anticipated sea level rise and other reasonably foreseeable consequences of climate change and extreme weather events	Minimizes health/safety risk to public from earthquake-caused reductions in water delivery quality and quantity from the SWP	Restores and protects ability of the SWP to deliver water in compliance with regulatory and contractual constraints	Could provide operational flexibility for the SWP to improve aquatic conditions and manage future regulatory constraints	Meets at least two objectives	Will the alternative result in fewer or lesser environmental impacts than the proposed project or other alternatives?	
Portfolio Approach without Water Conveyance Facilities	N	N	N	N	N	-	-
Integration of Water Conveyance with Other Projects (as described above)	N	N	N	N	N	-	-
Alternative locations for Diversion Facilities along the Sacramento River in the North Delta	Y	Y	Y	Y	Y	N	N

1 NOP = Notice of Preparation; SWP = State Water Project

3A.5 Identification of Capacities

As indicated in DWR's January 15, 2020, NOP, DWR is considering alternatives to the proposed project with capacities that range from 3,000 to 7,500 cfs, with an option for CVP involvement with the 7,500 cfs alternatives. For that reason, the central and eastern alignments are being analyzed at various conveyance capacities within this range. The Bethany Reservoir alignment is being analyzed at a 6,000-cfs capacity. Although the Bethany Reservoir alignment is analyzed only at a 6,000-cfs capacity, that does not preclude DWR from approving it with another operational capacity, should DWR choose to do so.

3A.6 Identification of Operations

The identification of the proposed operations considered an appropriate balance between exports and ecological issues in the Delta. A new set of operational criteria was developed for the proposed north Delta intakes using the operational criteria from California WaterFix as an initial starting point. California WaterFix operations criteria for the north Delta intakes were developed in collaboration with federal and state fishery agencies for the BDCP in 2010, continuing through development of the California WaterFix BiOps. These criteria are intended to meet the ESA requirement to minimize and mitigate incidental take to the maximum extent practicable, as well as to minimize other potential environmental impacts.

The proposed north Delta diversion intakes would operate in conjunction with the existing SWP/CVP intakes in the south Delta. Operations of the existing SWP facilities would be governed by the applicable regulatory requirements specified under the State Water Board's *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan), federal BiOps, CESA Incidental Take Permit for SWP, and USACE Clifton Court diversion limits. The operations of the proposed north Delta diversion intakes would remain consistent with these existing regulatory requirements and any additional requirements resulting from Delta Conveyance Project permitting. In addition, diversions at the proposed north Delta intakes would be governed by new operational criteria specific to these intakes, such as the fish screen approach and sweeping velocity requirements, bypass flow requirements, and pulse protection.

The new operational criteria would govern the diversions at the proposed north Delta intakes to minimize the near-field and the far-field effects of the intake operations on sensitive fish species.⁵ The following criteria minimize effects of the proposed intake operations on fish passage, survival in the intake reach, and through-Delta survival of migrating fish.

- Approach and sweeping velocity requirements at the intake fish screens
- North Delta diversion bypass flow requirements
- Pulse protection
- Low-level pumping/minimum allowable diversions

⁵ *Near-field effects* are those occurring in close proximity to intake screens, e.g., entrainment or impingement; *far-field effects* are those occurring farther from intakes, e.g., reduced survival because of less flow in the Sacramento River downstream of the intakes.

1 As noted above, the starting point for these criteria is the California WaterFix and BDCP. These
2 criteria were validated and discussed with the fishery agencies in the context of the latest and the
3 best available scientific information. Operations are described in more detail in Chapter 3,
4 *Description of the Proposed Project and Alternatives*, and Appendix 5A, *Modeling Technical Appendix*.

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