Delta Conveyance Project Operations Plan

Table of Contents

Acronyms and Abbreviations

AF	Acre Feet
BiOps	Biological Opinions
CCF	Clifton Court Forebay
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CFS	Cubic Feet per Second
COA	Coordinated Operations Agreement
CVP	Central Valley Project
DCC	Delta Cross Channel
DCP	Delta Conveyance Project
DWR	California Department of Water Resources
EC	Electrical Conductivity
E/I	Export/Inflow
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FEIR	Final Environmental Impact Report
ITP	Incidental Take Permit
LTO	Long term operations
NDD	North Delta Diversion
NDOI	Net Delta Outflow Index
NMFS	National Marine Fisheries Service
OAMMP	Operations Adaptive Management and Monitoring Plan
SAC	Sacramento River
SJR	San Joaquin River
SOD	Sout of Delta
SWB	State Water Resources Control Board
SWP	State Water Project
TUCP	Temporary Urgency Change Petition
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USFWS	United States Fish and Wildlife Service
WOMT	Water Operations Management Team
WQCP	Water Quality Control Plan

Definitions

Terms used in this Delta Conveyance Project Operations Plan are defined below.

Approach Velocity is the measure of flow during operation of the diversion intake, perpendicular to the fish screens' inlet holes and entering the intake.

Balanced Conditions are as defined in the Coordinated Operations Agreement: periods when it is agreed that releases from upstream reservoirs plus unregulated flow approximately equal the water supply needed to meet Sacramento Valley inbasin uses, plus exports.

Bypass Flow is the flow remaining in the Sacramento River immediately downstream of the proposed Delta Conveyance Project north Delta diversion intakes.

Carriage Water is the additional flow, added to Delta outflow, that is needed to carry a unit of water through the Delta to the south of Delta diversion facility in order to maintain salinity requirements.

Coordinated Operations Agreement is the Agreement Between the United States of America and the State of California for Coordinated Operation of the Central Valley Project and the State Water Project.

Emergency means a sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services. "Emergency" includes such occurrences as fire, flood, earthquake, or other soil or geologic movements, as well as such occurrences as riot, accident, or sabotage. (Ca. Pub. Res. Code § 21060.3)

Excess Conditions are as defined in the Coordinated Operations Agreement: periods when it is agreed that releases from upstream reservoirs plus unregulated flow exceed Sacramento Valley inbasin uses, plus exports.

Excess Flows are when the Delta has flows in excess of the in-basin uses and the amount necessary to comply with regulations, considering existing facilities.

Maintenance Flow Diversions are low level flows necessary to keep DCP infrastructure operational.

OAMMP is the Operating Adaptive Management and Monitoring Plan as defined in the DCP Incidental Take Permit application Appendix 3B.

Pulse Protections are additional restrictions for north Delta diversions that provide protection for fish passing through the intake reach and Delta above and beyond the Bypass Flow requirements.

Ramping Rate means the rate of increase or decrease in diversions at the north Delta intakes.

Real-Time Operations are daily decisions made by operators based on evaluation of many factors in order to operate the SWP in coordination with the CVP and meet applicable requirements.

Shifting for purposes of carriage water savings operations is diverting from the north Delta intakes in lieu of diverting SWP south Delta export facilities.

Sub Daily Operations are the implementation component of Real-Time Operations, where pumping units are turned on and off to schedules and where adjustments may need to be made to accommodate the dynamic nature of conditions (e.g., flow variation, tides), which may be different than projections.

Sweeping Velocity is the speed of the flow parallel to the intake screen and going past the fish screen informed by the average river velocities downstream of the north Delta intakes and as a function of a screen orientation.

USACE Clifton Court Permits mean those permits issued by the United States Army Corps of Engineers for Clifton Court operations, that have been and may be amended from time to time and include permit number SPK-1999-00715 and Public Notice 5820A dated October 13, 1981.

1.0 Introduction

This document presents a summary of the Delta Conveyance Project (DCP) operations commitments that the Department of Water Resources (DWR) has made for when the DCP becomes operational. These commitments have all previously been presented in several public documents, including the DCP Final Environmental Impact Report (FEIR) certified in December 2023 and the DCP Incidental Take Permit (ITP) Application submitted to the California Department of Fish and Wildlife (CDFW) in April 2024. The DCP will add two new diversion facilities or intakes (north Delta intakes) to the existing State Water Project (SWP) facilities. While DCP operations will be integrated into the SWP operations, there are several key operational parameters that will apply to how the DCP north Delta intakes will be used once it is constructed and operational. Figure 1-1 is a schematic of the new facilities to implement the DCP. DCP operations will be consistent with all of the following:

- Existing applicable water right permits;
- Any applicable laws or regulatory obligations and any subsequent updates thereto;
- Any permit issued for the DCP; and
- Any DCP Settlement with permit conditions.[1]

This DCP Operations Plan (Operations Plan) is intended to be a concise presentation of the DCP operations already presented in other documents to assist the reader in better understanding how the north Delta intakes will be operated. The Operations Plan is not intended to take precedence over applicable laws, regulations, or regulatory requirements.

This Operations Plan is a living document and will be updated periodically to reflect updates to applicable laws and regulations, permit requirements, and/or regulatory requirements. DWR has submitted a petition to the State Water Resources Control Board (SWB) for the change in point of diversion for existing SWP water rights to implement the DCP. Additionally, DWR has submitted various permit applications to other agencies, including an ITP Application to the CDFW. This Operations Plan is based on the FEIR and refined by the ITP Application content and will be adjusted and revised to reflect the final permit terms, if appropriate.

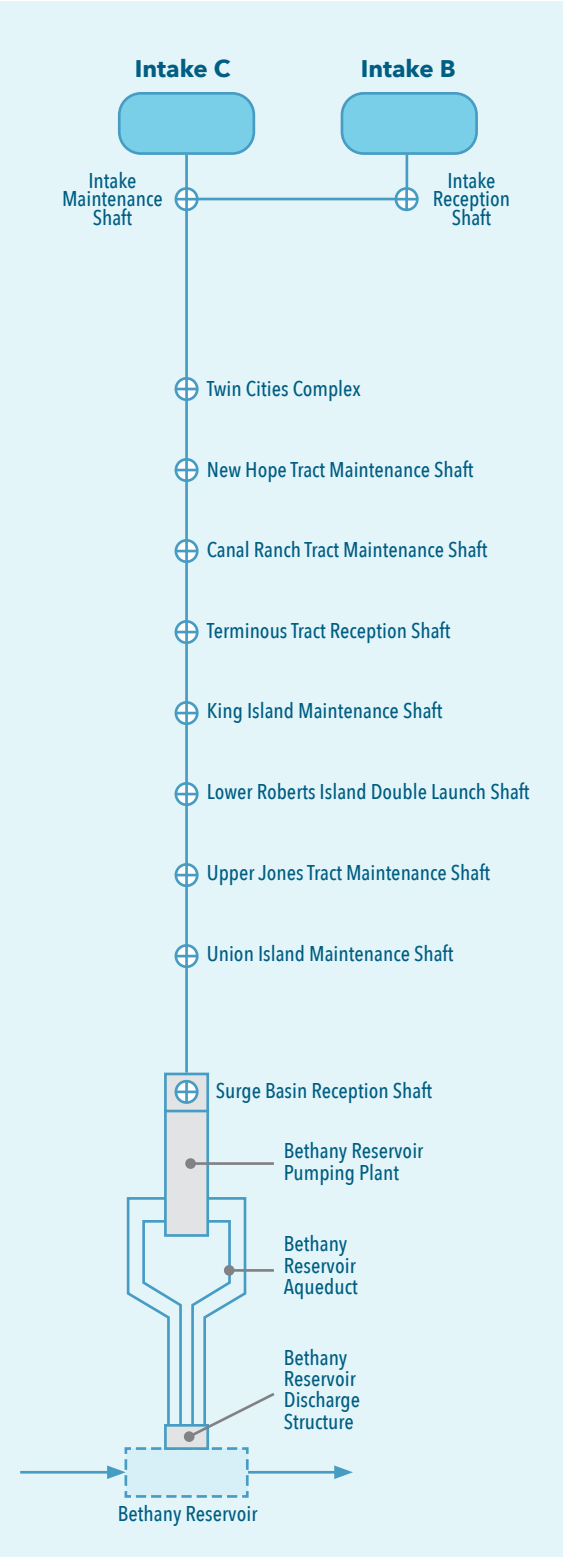


Figure 1-1 Delta Conveyance Project Schematic

[1] Settlement terms may be summarized in this document. Operational conditions in settlements are subject to the terms of the specific settlement and may only be applicable if DCP is built and becomes operational.

This Operations Plan does not address construction of the DCP or mitigation and monitoring related to the construction period. Rather, the Operations Plan is focused on how the DCP will be operated once it is constructed. Figure 1-2 shows the location of the north Delta intakes on the Sacramento River. Figure 1-3 shows the tunnel alignment. Figure 1-4 shows the location of facilities necessary to deliver water into Bethany Reservoir.

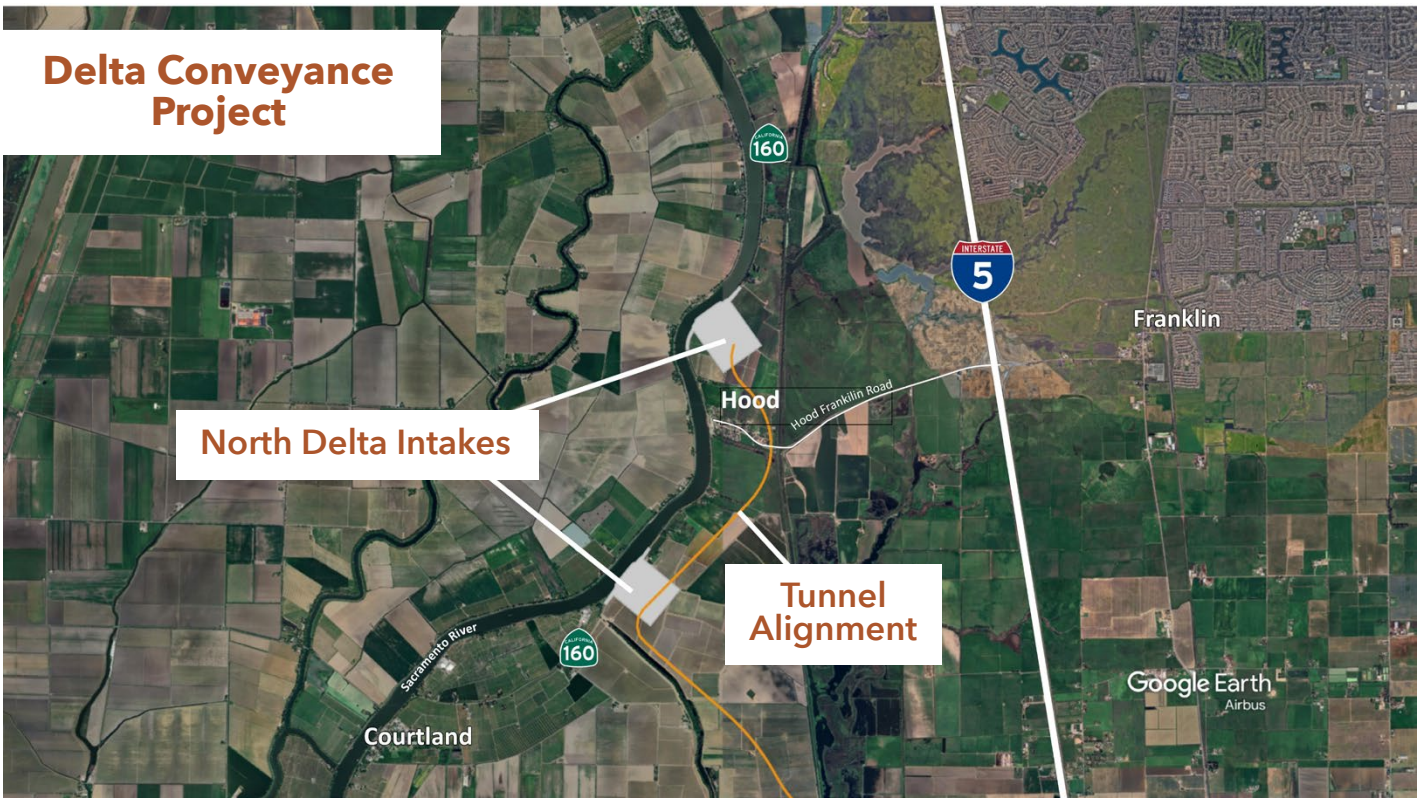


Figure 1-2 Proposed Intake Locations and Infrastructure

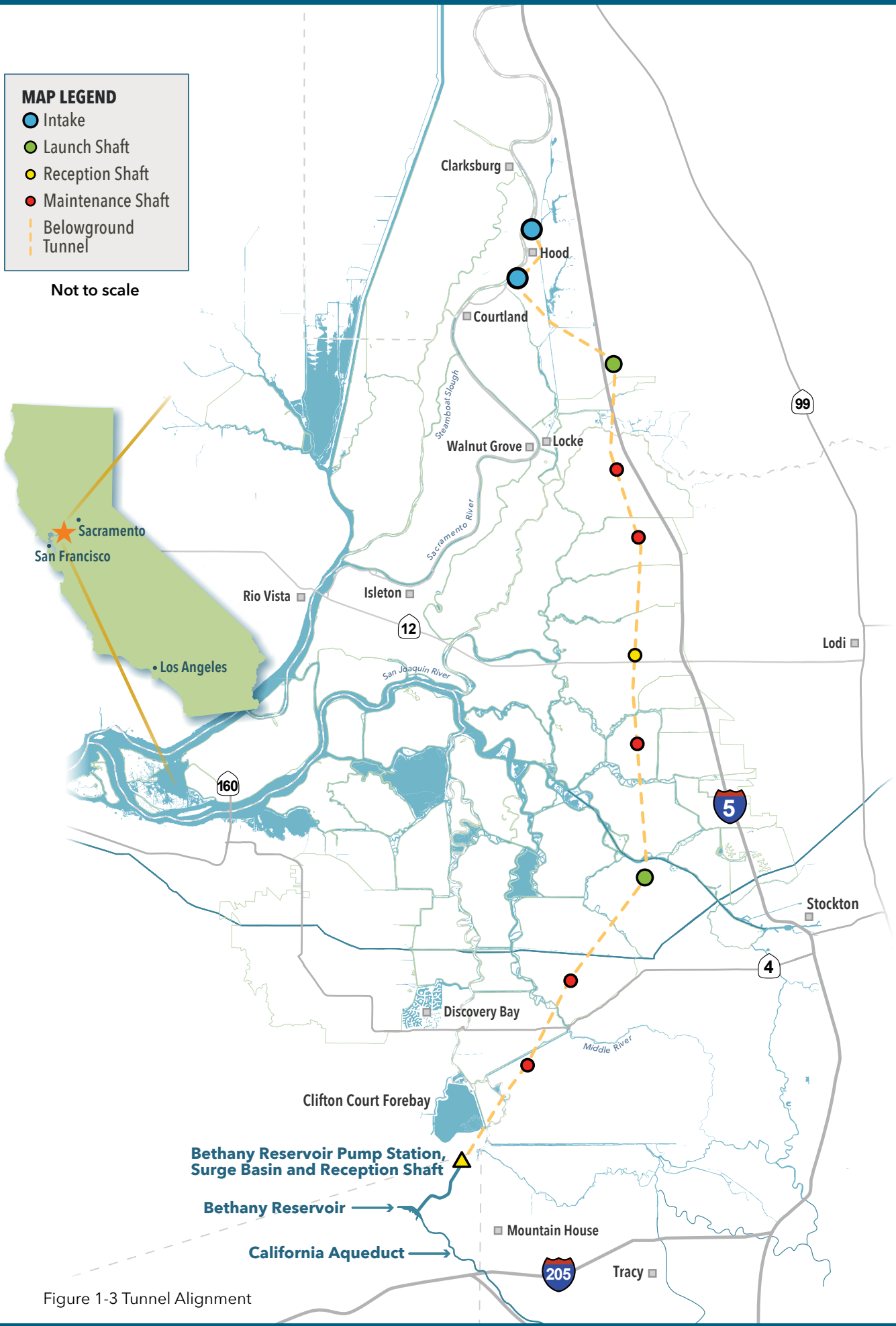


Figure 1-3 Tunnel Alignment

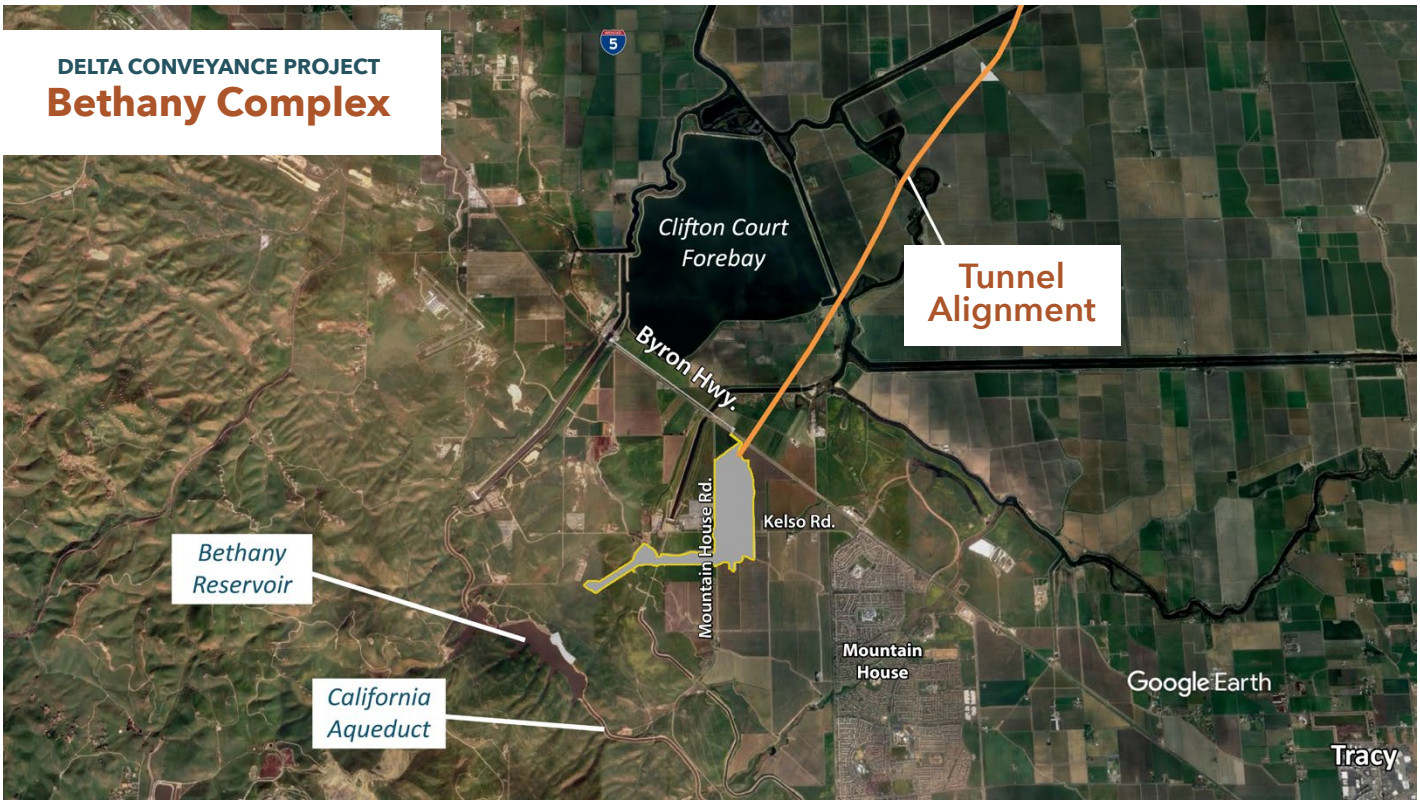


Figure 1-4 Bethany Facilities

1.1 Permits and other Regulations

This Operations Plan uses the preferred alternative (5) from the FEIR and refined by the ITP Application submitted to the CDFW as the starting point for DCP operations. DWR does not control the timeframe for review and issuance of any permit and thus cannot predict what additional restrictions, if any, will be placed on DCP operations. This Operations Plan is intended to be updated consistent with any permit conditions or other regulations applicable to the DCP that are added to or replace those currently in the Operations Plan. Nothing in this Operations Plan is intended to conflict with any permit or regulatory requirement. This Operations Plan is a tool to inform DCP operations but is not intended to obligate DWR to implement certain operations precisely as dictated in this plan.

DWR is not seeking additional permit coverage for existing SWP facilities. Existing SWP Delta operations are covered by the 2020 ITP for SWP long-term operations (LTO) (CDFW 2020).

2.0 Integration into Existing SWP Operations

Once the DCP is constructed, operations will be integrated into SWP operations and subject to the permits and legal requirements placed on the SWP, in addition to the DCP specific requirements and operations set forth in this Operations Plan and as described in section 1.1.

2.1 Upstream Reservoirs, including Oroville Reservoir

The DCP will not change operational criteria associated with upstream reservoirs. Upstream facilities will continue to be operated to meet then existing regulatory, environmental, and contractual obligations consistent with existing SWP operations.

DWR is committed to not changing upstream reservoir operations to move additional stored water through the north Delta intakes. DWR will not make additional stored water releases, beyond those possible as of the date of this Operations Plan without the use of the DCP, from the Lake Oroville Complex, or any other of its now existing upstream reservoirs for the purpose of south Delta SWP exports, except as provided below. This will be achieved by limiting SWP water diversions at the existing south Delta facilities and the north Delta intakes to the amount allowed under the United States Army Corps of Engineers (USACE) Clifton Court Permits, when balanced conditions are declared and the Central Valley Project (CVP) and SWP are collectively withdrawing water from storage, excluding the following, each of which is subject to any applicable legal requirements:

i. Export of any carriage water savings generated by DCP operations;

ii. Export of any transfer or wheeling water consistent with applicable law; and

iii. Export of any (a) required upstream flood control releases; and (b) required regulatory releases capable of export.

2.2 Integration with the South Delta Operations

2.2.1 Excess Flow Operations

The north Delta intakes will operate in conjunction with the existing SWP south Delta export facility and would first maximize moving water through the south Delta export facility. The proposed intakes will augment the ability to capture Excess Flows and improve the flexibility of the SWP operations such as for meeting the SWB D-1641 Delta salinity and outflow requirements. The DCP is not proposing to increase the total quantity of water permitted for diversion under existing DWR water rights. The following describes the integration of the DCP with the existing SWP south Delta facilities.

During the winter and spring when there are available Excess Flows in the system:

- The SWP will first use south Delta facilities to divert water up to what is permitted under the existing water rights and all applicable state and federal laws and regulations. Following that, if operators determine water is available in excess of the amount required to comply with state and federal laws and regulations, the north Delta intakes will be used to capture these additional flows, consistent with existing water rights for total SWP exports (i.e., the existing 10,350 cfs limitation in DWR's water right will remain and govern combined north and south Delta SWP diversions).
- Relocating the diversion from the SWP south Delta export facility to the north Delta intakes has trade-offs and is not expected unless there is an operational advantage to do so at the discretion of DWR and in coordination with the United States Bureau of Reclamation (USBR), and fish and wildlife agencies, and through the Water Operations Management Team (WOMT) (e.g., to provide additional real-time south Delta fish protections).
- There will likely be conditions where diversions through the north Delta intakes are not maximized even when the Bypass Flow requirements will allow greater diversions. Examples of these conditions may include when other operational criteria are controlling or when south of Delta storage is full. (See section 3.0 for more information on Bypass Flow requirements and other operational criteria.)

2.2.2 Balanced Condition Operations

During the late spring, summer, and fall, when the SWP is typically operating to meet SWB D-1641 salinity and outflow requirements in the Delta:

- Both the existing SWP south Delta export facility and the north Delta intakes will be operated together to meet the SWB D-1641 salinity and outflow requirements.
- Some level of combined SWP and CVP south Delta diversions will be needed to manage salinity in the Old River and Middle River corridor. From July through September, if the combined SWP and CVP south Delta diversions are less than 3,000 cfs, SWP water will not be diverted through the north Delta intakes facility.
- The south Delta diversions and the north Delta diversions will be balanced and adjusted to meet the SWB D-1641 salinity requirements at the western Delta stations on the Sacramento and San Joaquin Rivers (e.g., increasing salinity at Jersey Point could be managed by reducing diversions from the south Delta intake and increasing a like amount at the north Delta intakes, whereas increasing salinity at Emmaton could be managed by reducing diversions from the north Delta intakes and increasing a like amount at the south Delta intake). This operation is expected to result in a more efficient system operation where less water will be required to meet the same water quality standards and result in additional water that could either remain in storage or be diverted.
- Upstream SWP storage operations will continue to be managed to the existing and future regulatory and contractual obligations of the SWP in determining the amount of stored water available for diversion. DWR will not increase storage withdrawal for diversions even though the DCP may provide additional diversion capacity. The exceptions are described in section 2.1.

Nothing in this section will preclude DCP diversions for low level maintenance as described in section 5.0 or in Emergency situations as described in section 6.0.

2.2.3 Carriage Water Operations

During balanced conditions, the DCP may be utilized to more efficiently manage water quality conditions in the western Delta, resulting in a Carriage Water savings. Carriage Water savings can be generated by moving some limited amount of south Delta pumping from Clifton Court Forebay to the DCP.

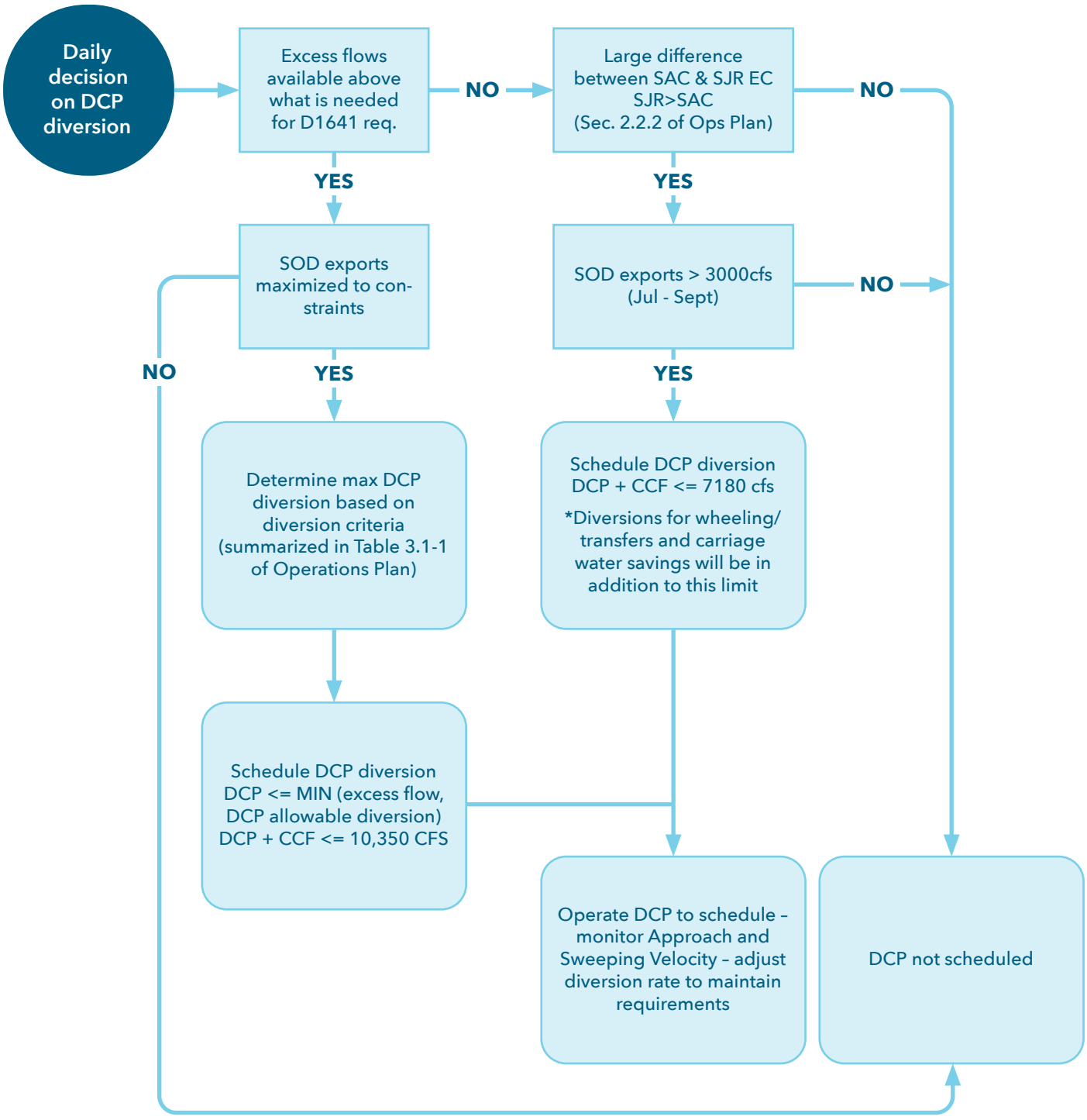
Carriage Water is the additional flow, added to Delta outflow, that is needed to carry a unit of water through the Delta to the south of Delta diversion facility in order to maintain salinity requirements. The primary driving Delta standard for Carriage Water is the Jersey Point requirement on the San Joaquin River in the western Delta. This station is also used as a monitoring station when the Jersey Point requirement is no longer in effect for the season. The SWP (and CVP) monitor and make adjustments to SWP (and CVP) operations based on Jersey Point salinity to maintain interior and south Delta salinity for Municipal and Industrial water quality requirements.

The north Delta diversions will improve the flexibility of SWP operations to meet water quality requirements during late spring through early fall. The amount of Shifting from diversions in the south Delta to the north Delta will be primarily determined by salinity conditions in the western Delta at Emmaton on the Sacramento River and Jersey Point on the San Joaquin River, during the summer and fall seasons. During the summer and fall, DWR could shift a portion of the SWP diversions from the SWP south Delta export facility to the north Delta intakes to help reduce salinity at Jersey Point while continuing to meet other water quality standards and operational criteria.

Shifting from the SWP's south Delta export facility to the north Delta intakes could reduce the need for Carriage Water releases from upstream reservoirs or improve the SWP's ability to divert those releases in the Delta while still maintaining water quality requirements. During these periods when the proposed north Delta intakes are operating to more efficiently manage Delta water quality, the Carriage Water savings could either be diverted or stored in upstream reservoirs for future use. Decisions regarding diversion or storage of saved Carriage Water will meet all regulatory and contractual requirements.

SWP operators will use the DCP to balance south Delta diversions and the proposed north Delta diversion so that less water or Delta outflow will be required to meet the same water quality standards. The Shifting that could occur is primarily defined by the summer and fall season. SWP operators, in real time, will primarily use salinity conditions at Jersey Point and Emmaton to determine if Shifting will be beneficial and result in reduced Carriage Water. Other operational limits will be followed when making these decisions. Shifting can be limited by the following: (1) export/inflow (E/I) ratio; (2) north Delta diversion Bypass Flow requirement, or other sub-daily criteria; (3) maintaining total south Delta diversions greater than 3,000 cfs, July through September. (4) total combined SWP diversion at the south Delta and north Delta diversions less than or equal to 7,180 cfs, excluding diversions for transfers and wheeling.

DCP Operational Decision Flow Chart



DCP Diversions will be scheduled considering, but not limited to:

- Meeting WQCP/ESA/CESA requirements
- Demand and available storage
- Forecasted Tides

2.3 Temporary Urgency Change Petitions

Given the commitment to operate the south Delta SWP facilities as described in section 2.2, the conditions during a Temporary Urgency Change Petition (TUCP) are not times when the north Delta intakes will likely be used. The SWB retains its authority under the California Water Code to address emergencies and act in ways that can protect the State's interests, and the DCP does not seek to modify those authorities. Future circumstances under which the SWB will be responding to emergencies are unknown at this time.

3.0 North Delta Intakes Operations

3.1 Bypass Flows and Other Criteria

Bypass Flow is calculated as the three-day tidally averaged flow remaining in the Sacramento River immediately downstream of the proposed north Delta intakes and calculated using the three-day average 25-hour tidal cycle at Freeport minus three-day average diversion at the north Delta intakes. Bypass Flows include several criteria that are subject to change through the permitting process and are discussed by timeframe below[2]. Each bypass criterion and other criterion are shown on Table 3.1-1 below and discussed in more detail in the following subsections.

Criteria	Description
Minimum Bypass Flow	July- September 5,000 cfs computed as flow measured at Freeport minus the diversion rate at the north Delta intakes (See Section 3.1.1)
Minimum Bypass Flow	October- November 7,000 cfs computed as flow measured at Freeport minus the diversion rate at the north Delta intakes (See Section 3.1.2)
Bypass Flows at Level 1-2-3	December through June (See Section 3.1.3): Three levels (Levels 1, 2, and 3) of Bypass Flow requirements are proposed, with Level 1 being the most restrictive and Level 3 being the least restrictive of the diversions at the proposed intakes. If high Sacramento River inflows occur for long durations, the Bypass Flow requirement can transition from Level 1 to Levels 2 and 3. Once the pulse protection (see below) ends, north Delta diversions will not exceed Level 1 pumping unless specific criteria have been met to increase to Level 2 or Level 3. If those criteria are met, operations can proceed as shown in Table 3.1-2. Allowable diversion will be the greater of the following options: low-level pumping or the diversion allowed by the Bypass Flow rules in Table 3.1-2.
Spring Outflow Requirement	Modeled Spring Outflow Requirements (March through May) based on the Net Delta Outflow Index calculation: Minimum threshold Delta outflow will be determined prior to the initiation of operating the north Delta intakes through an adaptive management process. For analytical purposes, a threshold of 35,000 cfs (See Section 3.2) before diverting from the north Delta intakes is included in the modeling.
Unlimited Pulse Protection (See Section 3.3)	October through June: • Low-level pumping is allowed when river conditions are adequate during the pulse protection period. Definition: Low-level pumping of up to six percent of total Sacramento River flow at Freeport such that diversions will not reduce Bypass Flow below 5,000 cfs. Low-level pumping can occur in October–June during a pulse protection event and in December–June during Level 1-2-3 as defined in Table 3.1-2. • Pulse triggering, duration, and conclusion to be informed by real-time environmental conditions, including fish-based information. Specific triggers to be identified in the Operations Adaptive Management and Monitoring Plan (OAMMP). • If a pulse begins before December 1, the Bypass Flow criteria for the month (October and November) when the pulse occurred will take effect, following a pulse protection period. Beginning on December 1, the Level 1 rules defined in Table 3.1-2 apply unless additional pulses occur. Pulse protection operations include a 35,000 cfs Bypass Flow low-level pumping off-ramp. Real-Time Operations: The proposed operations criteria are intended to minimize and fully mitigate the potential impacts of the DCP operations. The real-time decision-making specific to the DCP operations will be mainly associated with reviewing real-time abiotic and fish monitoring data and ensuring proposed weekly, daily, and sub-daily operations are consistent with the permitted criteria and within the effects analyzed in the permits.
Approach and Sweeping Velocities	North Delta diversions at all the intake screen units will be subject to a maximum Approach Velocity of 0.2 feet per second and a minimum Sweeping Velocity in the river of 0.4 feet per second. Velocity compliance will be informed by real-time hydrological and diversion flow data measured at each of the intake locations[3].

Table 3.1-1: North Delta Intakes Operations Criteria

[2] In addition to the operational criteria developed for the north Delta intakes, routine maintenance and testing is described in Section 5.

[3] Location of gages to be determined by permitting and other legal requirements.

3.1.1 Bypass Flows

3.1.1.1 July through September

During the timeframe from July through September, the minimum Bypass Flow must be 5,000 cfs, based on a three-day average, prior to any diversion into the DCP. Additionally, during this timeframe DCP operations will be informed by salinity management/Carriage Water savings opportunities consistent with section 2.0.

3.1.1.2 October through November

During the timeframe from October through November the minimum Bypass Flow must be 7,000 cfs, based on a three-day average, prior to any diversion into the DCP. Additionally, during this timeframe DCP operations will be informed by salinity management/Carriage Water savings opportunities consistent with section 2.0.

3.1.1.3 December through June

During the timeframe from December through June the minimum Bypass Flow will be based on Level 1-2-3 as described in Table 3.1-2. Three levels (Levels 1, 2, and 3) of Bypass Flow requirements are proposed, with Level 1 being the most restrictive and Level 3 being the least restrictive of the diversions at the proposed intakes. If high Sacramento River inflows occur for long durations, the Bypass Flow requirement can transition from Level 1 to Levels 2 and 3. Once the pulse protection (see below) ends, north Delta diversions will not exceed Level 1 pumping unless specific criteria have been met to increase to Level 2 or Level 3. If those criteria are met, operations can proceed as shown in Table 3.1-2. Allowable diversion will be the greater of the following options: low-level pumping or the diversion allowed by the Bypass Flow rules in Table 3.1-2.

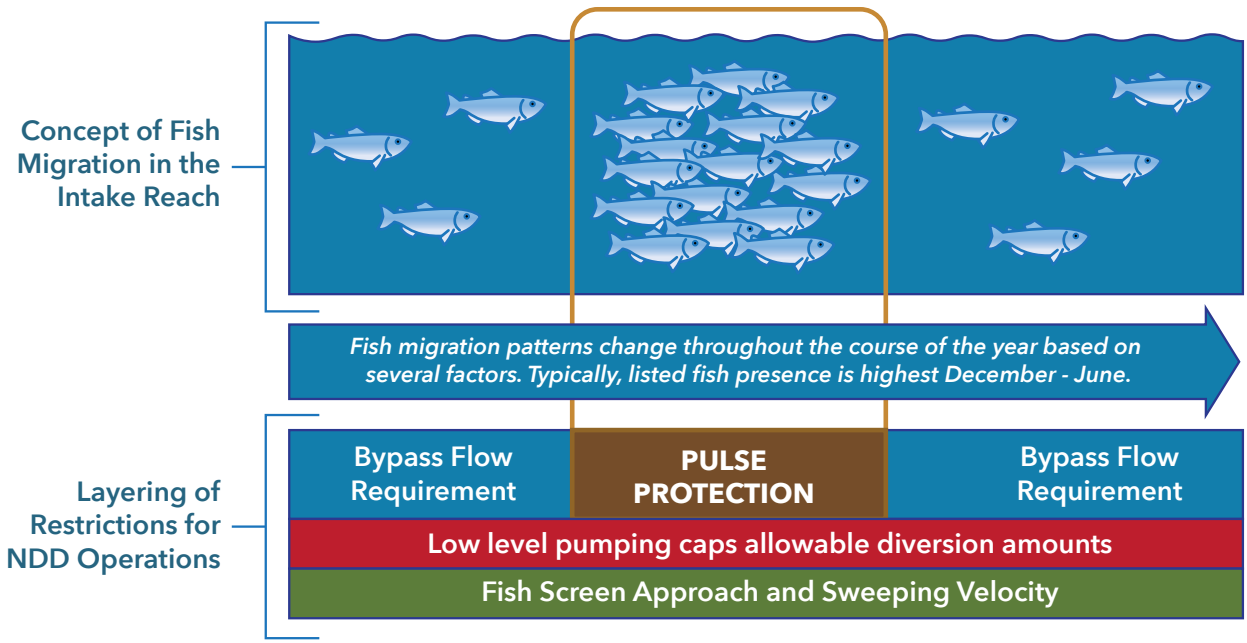
3.2 Spring Outflow

During the March through May timeframe, DCP operations will include minimum spring outflow requirements based on the Net Delta Outflow Index calculation. During this period, north Delta intakes operations will not begin until Delta outflow exceeds a minimum threshold flow. The threshold flow will be determined prior to the initiation of operations through the adaptive management process. For analytical purposes, the threshold flow of 35,000 cfs is included in the modeling.

3.3 Unlimited Pulse Protection

Pulse protection events occur as described below and are additional protection for fish above and beyond the Bypass Flow requirements. Figure 3.1-1 below is a simplified diagram, not to scale, to demonstrate how the Bypass Flow and pulse protection events work conjunctively.

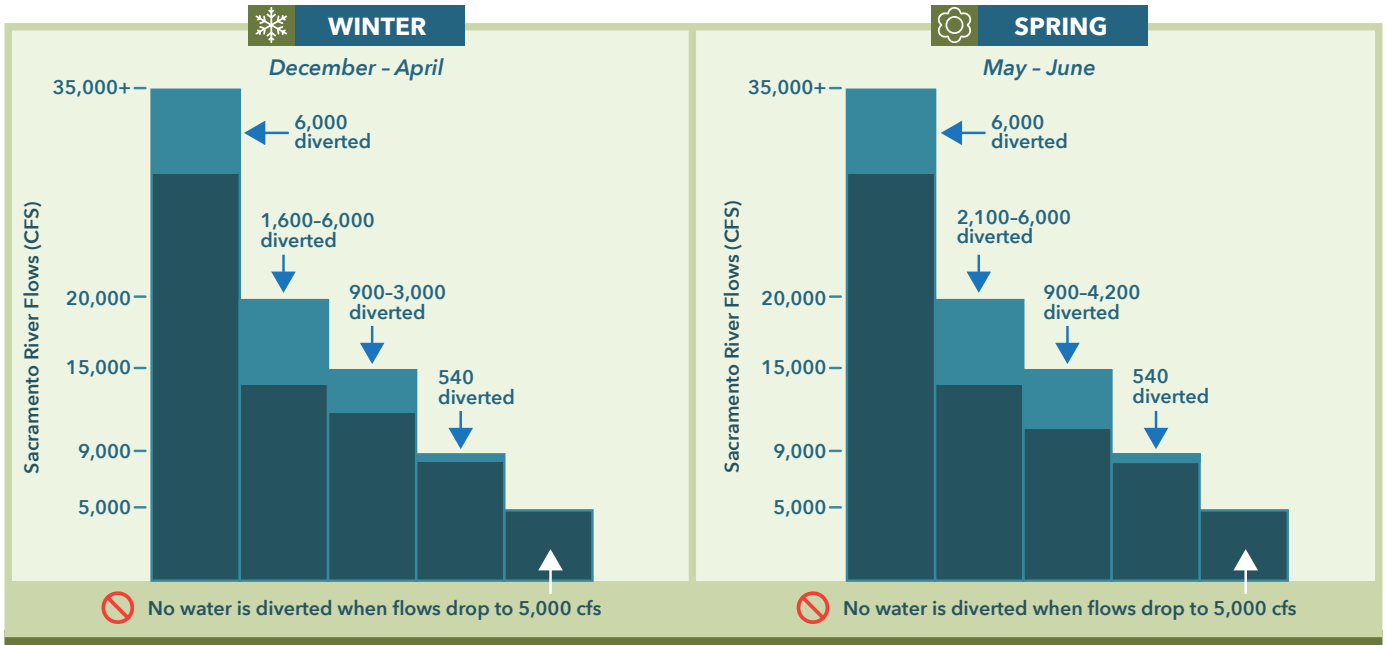
North Delta Diversion Operations Criteria Concepts



Flows and Water Quality Protected

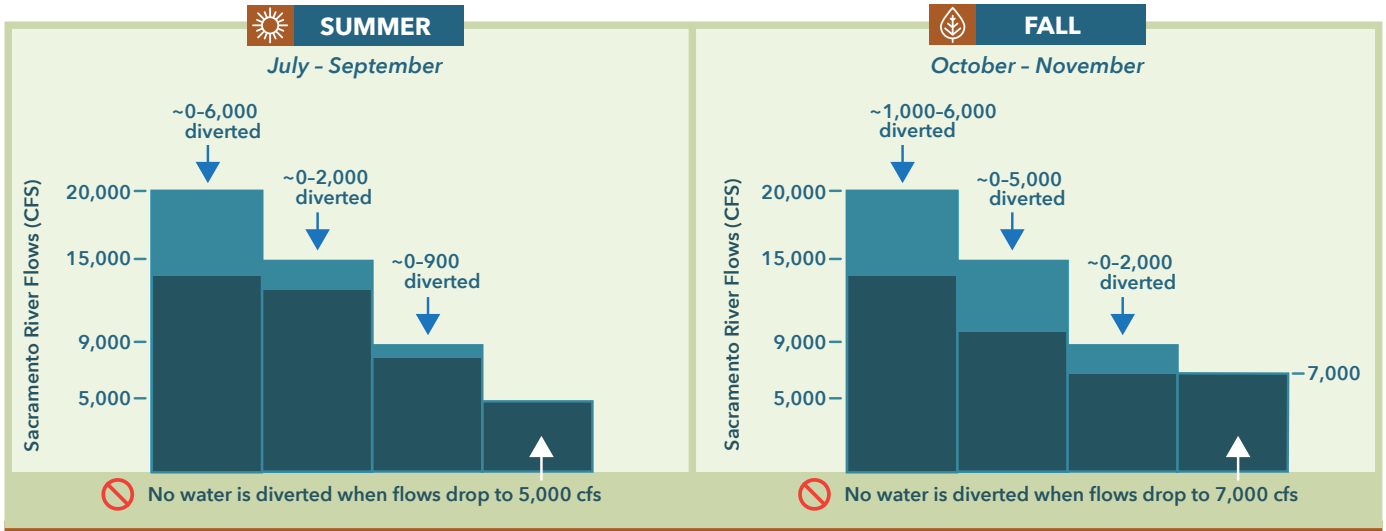
To ensure adequate Delta flows for water quality and fish, Sacramento River diversions are based on many factors. Additionally, diversions vary depending on season, serving different purposes including capturing excess storm water in the winter and spring months and adding operational flexibility while managing Delta requirements in the summer and fall. For the DCP, the maximum allowable diversion for the new intakes is 6,000 cfs, when the river is at the applicable flow and other conditions are met.

Operations would require a level of Sacramento River flow passing the intakes (as well as maintaining required Sweeping Velocities) before water could be diverted. This figure represents a range of potential diversions (three-day average) based on the North Delta Diversion operational criteria. Other operating constraints will likely limit diversions to less than the range provided, however.



STORM WATER CAPTURE

Diversions during the winter and spring represent maximum amounts allowed depending on bypass flow requirements (i.e. levels 1, 2, and 3), which dictate the amount of flow that is required to remain in the river when the intakes are diverting water. Diversions will also be governed by fish screen Approach Velocity and other Delta requirements.



SALINITY MANAGEMENT AND OTHER DELTA REQUIREMENTS

While the proposed criteria allow for diversions up to 6,000 cfs during the summer and fall, diversions depicted during this period represent expected amounts that would fluctuate to meet water quality and other Delta requirements. At times, diversions for storm water capture may occur in the fall.

** Graphs are not meant to represent river stage, which is the water surface elevation in the river. As specified above, they are meant to demonstrate river flows and associated diversions.*

Pulse protection is initiated when a large number, and relatively high concentration, of winter-run-sized juvenile salmonids begin migrating into the Delta from upstream locations. Pulse protection helps further minimize potential decreases in survival for migrating salmonids in the intake reach, as well as through-Delta, and minimize the potential for upstream advection of fish, further enhancing the protections offered by the Bypass Flow requirements.

A pulse flow is a natural occurrence typically caused by the first runoff event(s) of the season. Monitoring data suggest that these winter run-off events (e.g., as indicated by sharp increases in Wilkins Slough flows, located upstream of the confluence of the Feather and Sacramento Rivers) are often associated with large numbers of juvenile, winter-run-sized salmonids, moving from natal upstream locations into lower Sacramento River reaches and the Delta (del Rosario et al. 2013).

When the pulse protection operation is triggered, Bypass Flow (and co-occurring fish) will be further protected by operating the north Delta intakes to the low-level pumping rules.

The north Delta intakes operational criteria include unlimited pulse protections during October through June to minimize effects on migrating, listed salmonids, such as winter-run and spring-run juvenile Chinook salmon. During pulse protections, low-level pumping of six percent of Freeport flows will be allowed[4]. Pulse protection operations also include a 35,000 cfs Bypass Flow low-level pumping off- ramp, when risk to migrating salmonids are lower (i.e., studies have indicated salmonid flow- survival relationships approach an asymptote at approximately 35,000 cfs; increases in Georgiana Slough tidal reverse flows are not expected at this flow level). When the off-ramp is triggered, the north Delta intakes can divert the greater of six percent Freeport flows or an amount that leaves Bypass Flows above 35,000 cfs in the Sacramento River.[5] In addition, initiation and ending of pulse protections will be informed by real-time environmental conditions, including fish-based information, such as data from upstream monitoring stations and juvenile production estimates. The OAMMP will be used to identify specific fish-based triggers in the future, as needed.

For modeling purposes, the initiation of a pulse protection event is defined by the following criteria:

- Increase in flow of the Sacramento River at Wilkins Slough by more than 45 percent within a five-day period.
- Sacramento River flows on the fifth day are greater than 10,500 cfs measured at Wilkins Slough.

For modeling purposes, the cessation of a pulse protection event is triggered by any of the following :

- Wilkins Slough returns to pre-pulse flows (flow on first day of the five-day increase);
- Sacramento River at Wilkins Slough flows decrease for five consecutive days; or
- Sacramento River at Wilkins Slough flows are greater than 20,000 cfs for 10 consecutive days.

[4] When a pulse protection event ends during the Level 1-3 Bypass Flow criteria timeframe, DCP diversions will reset to Level 1.

[5] For example, with these numbers at the time of the offramp, the north Delta intakes could divert six percent of flows up to 37,234 cfs at Freeport. Once flows are above 37,234 cfs at Freeport diversions can increase so long as the bypass of 35,000 cfs remains.

Table 3.1-2 Bypass Flow and Pulse Protection Requirements

North Delta Diversion Bypass Flow and Pulse Protection Requirements

This table further details a few of the criteria for the north Delta diversion operations included in Table 3.1-1.

Pulse Protection

Unlimited pulse protections during the October through June period. Low-level pumping (Table 3.1-1) will be allowed when river conditions are adequate during the pulse protection period. For modeling purposes, initiation of the pulse protection is defined by the following criteria:

(1) Sacramento River daily average flow at Wilkins Slough increase by more than 45% within a 5-day period and (2) flow on the 5th day greater than 10,500 cfs.

The pulse protection continues until either (1) Sacramento River flow at Wilkins Slough returns to pre-pulse flow level (flow on first day of 5-day increase), or (2) Sacramento River flow at Wilkins Slough decreases for 5 consecutive days, or (3) Sacramento River flow at Wilkins Slough is greater than 20,000 cfs for 10 consecutive days. After pulse period has ended, operations will return to the Bypass Flow table (Sub-Table A).

In addition, pulse protection operations include a 35,000 cfs Bypass Flow off-ramp. When the off-ramp is triggered, the north Delta intakes can divert the greater of 6% Freeport flows or an amount that leaves Bypass Flows above 35,000 cfs in the Sacramento River.

Bypass Flow Criteria

After initial pulse(s), allowable diversion will be subject to Level 1 Bypass Flow criteria (Sub-Table A) until 15 total days of Bypass Flows above 20,000 cfs occur. Then allowable diversion will be subject to the Level 2 Bypass Flow criteria until 30 total days of Bypass Flows above 20,000 cfs occur. Then allowable diversions will be subject to the Level 3 Bypass Flow criteria.

cfs = cubic feet per second.

Sub-Table A. North Delta Diversion Bypass Flow Criteria[a]

December through April
(allowable diversion will be the greater of the low-level pumping or the diversion allowed by the following Bypass Flow rules)

Level 1 Bypass Flow Criteria			Level 2 Bypass Flow Criteria			Level 3 Bypass Flow Criteria		
If Sacramento River flow is over	...But not over	...The bypass is	If Sacramento River flow is over	...But not over	...The bypass is	If Sacramento River flow is over	...But not over	...The bypass is
0 cfs	5,000 cfs	100% of the amount over 0 cfs	0 cfs	5,000 cfs	100% of the amount over 0 cfs	0 cfs	5,000 cfs	100% of the amount over 0 cfs
5,000 cfs	15,000 cfs	Flows remaining after low-level pumping	5,000 cfs	11,000 cfs	Flows remaining after low-level pumping	5,000 cfs	9,000 cfs	Flows remaining after low-level pumping
15,000 cfs	17,000 cfs	15,000 cfs plus 80% of the amount over 15,000 cfs	11,000 cfs	15,000 cfs	11,000 cfs plus 60% of the amount over 11,000 cfs	9,000 cfs	15,000 cfs	9,000 cfs plus 50% of the amount over 9,000 cfs
17,000 cfs	20,000 cfs	16,600 cfs plus 60% of the amount over 17,000 cfs	15,000 cfs	20,000 cfs	13,400 cfs plus 50% of the amount over 15,000 cfs	15,000 cfs	20,000 cfs	12,000 cfs plus 20% of the amount over 15,000 cfs
20,000 cfs	no limit	18,400 cfs plus 30% of the amount over 20,000 cfs	20,000 cfs	no limit	15,900 cfs plus 20% of the amount over 20,000 cfs	20,000 cfs	no limit	13,000 cfs plus 0% of the amount over 20,000 cfs

[a] Level 1, Level 2 and Level 3 Bypass Flow criteria do not apply July through November. Minimum Bypass Flow criteria are applicable July through November as described in the Table 3.1-2.

Sub-Table A. North Delta Diversion Bypass Flow Criteria[a] (continued)

May
(allowable diversion will be the greater of the low-level pumping or the diversion allowed by the following Bypass Flow rules)

Level 1 Bypass Flow Criteria			Level 2 Bypass Flow Criteria			Level 3 Bypass Flow Criteria		
If Sacramento River flow is over	...But not over	...The bypass is	If Sacramento River flow is over	...But not over	...The bypass is	If Sacramento River flow is over	...But not over	...The bypass is
0 cfs	5,000 cfs	100% of the amount over 0 cfs	0 cfs	5,000 cfs	100% of the amount over 0 cfs	0 cfs	5,000 cfs	100% of the amount over 0 cfs
5,000 cfs	15,000 cfs	Flows remaining after low-level pumping	5,000 cfs	11,000 cfs	Flows remaining after low-level pumping	5,000 cfs	9,000 cfs	Flows remaining after low-level pumping
15,000 cfs	17,000 cfs	15,000 cfs plus 70% of the amount over 15,000 cfs	11,000 cfs	15,000 cfs	11,000 cfs plus 50% of the amount over 11,000 cfs	9,000 cfs	15,000 cfs	9,000 cfs plus 40% of the amount over 9,000 cfs
17,000 cfs	20,000 cfs	16,400 cfs plus 50% of the amount over 17,000 cfs	15,000 cfs	20,000 cfs	13,000 cfs plus 35% of the amount over 15,000 cfs	15,000 cfs	20,000 cfs	11,400 cfs plus 20% of the amount over 15,000 cfs
20,000 cfs	no limit	17,900 cfs plus 20% of the amount over 20,000 cfs	20,000 cfs	no limit	14,750 cfs plus 20% of the amount over 20,000 cfs	20,000 cfs	no limit	12,400 cfs plus 0% of the amount over 20,000 cfs

June
(allowable diversion will be the greater of the low-level pumping or the diversion allowed by the following Bypass Flow rules)

Level 1 Bypass Flow Criteria			Level 2 Bypass Flow Criteria			Level 3 Bypass Flow Criteria		
If Sacramento River flow is over	...But not over	...The bypass is	If Sacramento River flow is over	...But not over	...The bypass is	If Sacramento River flow is over	...But not over	...The bypass is
0 cfs	5,000 cfs	100% of the amount over 0 cfs	0 cfs	5,000 cfs	100% of the amount over 0 cfs	0 cfs	5,000 cfs	100% of the amount over 0 cfs
5,000 cfs	15,000 cfs	Flows remaining after low-level pumping	5,000 cfs	11,000 cfs	Flows remaining after low-level pumping	5,000 cfs	9,000 cfs	Flows remaining after low-level pumping
15,000 cfs	17,000 cfs	15,000 cfs plus 60% of the amount over 15,000 cfs	11,000 cfs	15,000 cfs	11,000 cfs plus 40% of the amount over 11,000 cfs	9,000 cfs	15,000 cfs	9,000 cfs plus 30% of the amount over 9,000 cfs
17,000 cfs	20,000 cfs	16,200 cfs plus 40% of the amount over 17,000 cfs	15,000 cfs	20,000 cfs	12,600 cfs plus 20% of the amount over 15,000 cfs	15,000 cfs	20,000 cfs	10,800 cfs plus 20% of the amount over 15,000 cfs
20,000 cfs	no limit	17,400 cfs plus 20% of the amount over 20,000 cfs	20,000 cfs	no limit	13,600 cfs plus 20% of the amount over 20,000 cfs	20,000 cfs	no limit	11,800 cfs plus 0% of the amount over 20,000 cfs

Bypass Flow Criteria for July through September

If Sacramento River flow is over	...But not over	...The bypass is
0 cfs	5,000 cfs	100% of the amount over 0 cfs
5,000 cfs	No limit	A minimum of 5,000 cfs

Bypass Flow Criteria for September through November

If Sacramento River flow is over	...But not over	...The bypass is
0 cfs	7,000 cfs	100% of the amount over 0 cfs
7,000 cfs	No limit	A minimum of 7,000 cfs

[a] Level 1, Level 2 and Level 3 Bypass Flow criteria do not apply July through November. Minimum Bypass Flow criteria are applicable July through November as described in Table 3.1-2.

3.4 Sub Daily Operations

The Delta is a complex network of over 700 miles of tidally influenced channels and sloughs. Four strong forcing mechanisms drive circulation, transport, and mixing water in the Delta: (1) freshwater river and tributary flow to the Delta; (2) tides from the west propagating from the Pacific Ocean through the San Francisco Bay; (3) SWP and CVP water supply facilities operating in the Delta; and (4) collective effects of in-Delta agricultural diversions.

Reverse flows in the Sacramento River upstream of the DCP occur naturally, especially during low flows in the Sacramento River. As described below, DCP operations will have minimal effects on these reverse flows.

3.4.1 Uniform Daily Diversions

The north Delta intakes will be operated with uniform diversions throughout the day starting at 12:00 am. The diversion rate will be based on daily allotment[6] of DCP diversions adjusted for Ramping Rate and Sweeping Velocity requirements described below.

3.4.2 Diversion Ramping Rate

When diversions into the DCP begin and as they decline, they will occur consistent with a Ramping Rate. During all operational timeframes, the diversion Ramping Rate will not exceed an increase or decrease of more than 1,000 cfs every 15 minutes.

3.4.3 Approach and Sweeping Velocities

Approach Velocity for the DCP is limited to a maximum of 0.2 feet per second based on CDFW/United States Fish and Wildlife Service (USFWS) criteria for Delta fisheries species. To ensure the Approach Velocity criteria are met, instantaneous velocities will be calculated based on the real-time flows entering each intake screen unit divided by the intake screen's wedgewire surface area (i.e., the porous screening media). Gates behind the screen units will modulate to prevent excess flow through each screen unit. Facility performance testing and modeling studies will be conducted to demonstrate compliance with this CDFW criterion given that instantaneous velocities are calculated based on a uniform velocity assumption.

Sweeping Velocities are the speed of the flow parallel and going past the fish screen informed by the average river velocities downstream of the north Delta intakes. The DCP includes a minimum Sweeping Velocity requirement of 0.4 feet per second to further minimize near-field effects of the intakes operations, consistent with fish agency criteria. The minimum Sweeping Velocity will facilitate passage of fish and debris past the intakes. Sweeping Velocities will be informed by real-time river flows, less North Delta diversion intake flows, divided by the river's wetted cross-sectional area at a location just downstream of each screened intake facility. Refinements to these criteria will be considered through ongoing fish agency coordination and adaptive management. Diversion operations will be adjusted to account for natural tidally influenced river velocities.

3.4.4 Reverse Flows Upstream and Downstream of North Delta Intakes

The north Delta intakes diversion flows and Sweeping Velocity operations described above avoid or minimize increases in frequency or magnitude of tidal reverse flows at Freeport by effectively providing a limitation on the amount of time during the day that DCP diversions can occur (i.e., when low flows at Freeport become tidal and begin to have periods of the day that reverse direction on the flood tide). Under these conditions, diversion flows will be limited to periods when the river is moving in the downstream direction. It is expected that river Sweeping Velocities will significantly constrain daily diversions during lower river flow periods and thus minimize increasing tidal reverse flows. Once the DCP becomes operational, DWR will coordinate operations with the Sacramento Area Sewer District and Freeport Regional Water Authority operations and share projections of tidal reverse flows and any diversions that may be anticipated.

DCP bypass criteria were developed in coordination with state and federal fish agencies to minimize far-field effects of North Delta Diversions to reduce upstream transport of fish into Georgiana Slough and the Delta Cross Channel (DCC). These bypass criteria were developed based on available data and understanding of tidal reverse-flow hydrodynamics at this river junction. Low-level pumping, the most protective bypass rule that limits diversion up to six percent of Sacramento River flow at Freeport, will be implemented during fish pulse-flow events, which will minimize frequency and duration of flow reversals at Georgiana Slough.

Although DCP operations criteria are designed to avoid or minimize flow reversals, diverting water from the Sacramento River can potentially increase the frequency and duration of reverse-flow conditions. DWR will undertake tidal habitat restoration in the north Delta to mitigate for potential hydrodynamics-related effects. The mitigation approach will be focused on offsetting any incremental effects of DCP operations. The extent of this tidal habitat restoration will be determined in coordination with CDFW, National Marine Fisheries Service (NMFS), and USFWS.

[6] Daily allotment is based on a 3-day average.

4.0 USBR Coordination

When the DCP becomes operational, DWR will continue to coordinate with USBR to minimize or avoid additional outflow requirements or require additional upstream stored water releases due to DCP operations.

5.0 Maintenance Flows

Maintenance Flow Diversions may periodically be required for general facility maintenance at the Bethany Reservoir Pumping Plant, the north Delta diversions, and/or other tunnel system facility requirements. Maintenance Flow Diversions will likely only occur if the pumps are not otherwise exercised during normal monthly diversion operations. Maintenance Flow Diversions will be limited to a maximum of 300 cfs. The duration of these flows could be up to eight hours per pump per month. There are 14 pumps so in no event will these low-level Maintenance Flow Diversions exceed 112 hours per month. The maintenance flow requirements for other DCP facilities will be satisfied concurrently with the maintenance flow requirements of the pumping plant's unit maintenance.

Maintenance Flow Diversions will not reduce Bypass Flows below 5,000 cfs and are subject to Approach and Sweeping Velocity requirements described in section 3. Maintenance Flow Diversions will be coordinated as needed with other system operations to maintain regulatory compliance.

6.0 Emergency Situations

DWR may operate the DCP outside of the parameters provided in this Operations Agreement in the event of Emergency situations.

7.0 Transfers

Water Code section 1810 et seq. provides that a public entity may not deny a bona fide transferor of water access to available conveyance capacity if the conveyance of transfer water will not adversely affect the beneficial uses or quality of water in the facility and the conveyance can be provided without injuring any other legal user of water, without unreasonably affecting fish, wildlife, or other instream beneficial uses and without unreasonably affecting the overall economy or the environment of the county from which the water is being transferred.

The existing process for determining where there is unused capacity for transfers is described below. This information was used to determine if there was existing transfer capacity without the DCP.

In determining the availability of unused capacity within the SWP or CVP for transferring water, DWR and USBR operators analyze annual hydrology, project operations, contractor requests, and regulatory and operational restrictions. One such restriction is the 2019 Biological Opinions (BiOps) and the 2020 ITP. The 2019 BiOps and 2020 ITP limit water transfers to the months of July through November. Additionally, the annual volume is limited based on the Sacramento Valley Water Year Hydrologic classification. Even with operational constraints, the existing facilities typically have sufficient capacity to move desired water transfers, and adding the DCP is not expected to affect the amount of non- project water transfers that may occur during any water year type.

If some transfer water is conveyed through the DCP, then the amount of transfer water and associated Carriage Water flowing into the Delta could be reduced relative to the amount that occurs under existing conditions, depending on the hydrologic year and the amount of water purchased. The use of the DCP for water transfers will result in minimal effects on Delta water quality relative to current operations. Under current operations, the Carriage Water portion of the water transfer action maintains water salinity conditions in the Delta to be the same as without the water transfer. In other words, the "with" and "without" water transfer conditions under current operations will have similar Delta salinity conditions.

As such, transferring water through the DCP will result in similar Delta salinity conditions as "with" or "without" water transfer conditions under current operations, as the amount of Sacramento River inflow for transfer will be over and above the inflow required to meet the Delta salinity regulatory requirements, and diverting that water at the north Delta intakes does not result in any additional salinity changes in the Delta.

If water transfers were diverted through the proposed north Delta intakes, buyers may assume that they will receive a larger percentage of the purchased water because less Carriage Water will be needed to maintain water quality. This assumption may lead to buyers purchasing less transfer water, but the difference will likely be small. Any water transfers that use the DCP will comply with the all the criteria specified in this Operations Plan as it may be updated from time to time.

8.0 Changes to the Operations Plan

This Operations Plan was prepared for the sole purpose of compiling publicly available operational information for the purposes of the DCP change in point of diversion proceeding for the convenience of the public. This Operations Plan is a living document and will continue to be updated as the DCP receives final permits and as necessary in the future.

Delta Conveyance Project

water.ca.gov/deltaconveyance