

**CVP and SWP Drought Contingency Plan  
October 15, 2014 through January 15, 2015**

***Balancing Multiple Needs in Fall 2014***

From the October 7, 2014 Modified Order:

In consultation with the fisheries agencies, DWR and Reclamation shall develop a water year 2015 drought contingency plan for operations in the Delta and the associated Project reservoirs in the event that water supplies remain inadequate to satisfy the Projects' water right permit and license requirements and other uses. The drought contingency plan shall identify the biological and other justifications for the plan. The drought contingency plan shall also identify planned minimum monthly flow and storage conditions that consider Delta salinity control, fishery protection, and supplies for municipal water users related to projected flow and storage conditions using 50, 90, and 99 percent exceedance probabilities for assumed hydrology, and any other information that may be requested by the Executive Director or his designee. The plan for the beginning of the water year through January 15, 2015, shall be submitted to the Executive Director by October 15, 2014. The plan for the remainder of the water year after January 15, 2015, shall be submitted to the Executive Director by January 15, 2015. The plan shall be updated as necessary based on changed circumstances. Following submittal, the plans and any updates to the plans will be posted on the State Water Board's website for public review. The Executive Director will consider public comments that may be submitted when determining whether to take any action based on the plan or whether to request additional information.

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## **CVP and SWP Drought Contingency Plan October 15, 2014 through January 15, 2015**

This Drought Contingency Plan (Plan) is prepared by the U.S. Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR) working with U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and California Department of Fish and Wildlife (CDFW). The Plan will be updated as necessary based on changing circumstances which could include additional modifications to State Water Resources Control Board (SWRCB) permit requirements as well as federal Endangered Species Act (FESA) and California Endangered Species Act (CESA) consultation. Most importantly, the Plan, as described below, is based upon hydrologic conditions as of the end of September 2014.

### **I. Introduction and Purposes of the Plan**

Since December of 2013, State and Federal agencies that supply water, protect fish and wildlife, and regulate water quality have worked together to balance water supply, biological protections, and good quality of water during this drought. Together, these agencies developed a Drought Operations Plan (DOP) for April to November 2014 which incorporated regulatory adjustments to balance water supply and biological benefits. As California enters WY2015 following the severely dry 2014 water year, storage reservoirs are at low levels which create a challenge for water supply and environmental management.

The purpose of this Plan is to provide an overview of current conditions in the Central Valley Project (CVP) and State Water Project (SWP) - controlled reservoirs and the Delta related to salinity and fisheries, as well as an overview of available supplies for multiple beneficial uses as they relate to projected flow and storage conditions using 50%, 90%, and 99% exceedance probabilities for assumed hydrology. This Plan addresses projected water operations based on various hydrologic scenarios and potential adjustments to regulatory requirements through January 15, 2015.

### **II. Existing Conditions**

- A. Delta Salinity – Water quality in the Delta continues to be monitored as salinity in the western Delta continues to increase as is typical of dry falls. Currently, there are no exceedances of the water quality requirements within the control of the Projects. As a first step to moderate the gradual salinity degradation the Projects minimized exports and operated to a higher Net Delta Outflow Index (NDOI) than the nominal requirements under D-1641 in October. This is typically an adequate course of action until the first significant runoff events provide sufficient flow to significantly improve Delta salinity conditions. If a significant natural event is delayed for long enough, the Project operators would need to consider augmentation of Delta inflow with additional releases from upstream reservoirs.

B. Water Supply – The projects have conserved approximately 400 thousand acre-feet of water while operating under the existing TUCP Order and Drought Operations Plan. However, storage in upstream reservoirs still remains at near historic lows. Lake Oroville end-of-September storage was about 1.07 million acre-feet. Lake Shasta end-of-September storage was about 1.16 million acre-feet and Lake Folsom end-of-September storage was approximately 345 thousand acre-feet. Although low, these storages meet or exceed the 50% exceedance storages for the end of September as forecasted in the April 8, 2014 Drought Operations Plan. (See Attachment 1).

C. Fishery –

1. Salmonids: DWR and Reclamation operate to the 2009 NMFS Biological Opinion. DWR also operates under a consistency determination from CDFW on the Biological Opinion. On October 7, the Delta Operations for Salmon and Sturgeon (DOSS) Team met and they reported no catch of listed salmonids in the current water year at Tisdale Weir or Knights Landing rotary screw trap locations. Preliminary data for October 8 indicate a single winter run sized juvenile was observed at Knight Landing. However, triggers for the 2009 Salmon Biological Opinion Reasonable and Prudent Alternatives (RPA) Action IV.1.2 and RPA Action IV.1.1 based on flows and catch have not occurred. The Delta Juvenile Fish Monitoring Program has recorded no species of management concern in the Delta beach seines, or in the Mossdale, Sacramento, or Chippis Island trawls.
2. Delta Smelt: DWR and Reclamation operate to the 2008 Delta Smelt Biological Opinion issued by USFWS. DWR also operates under a consistency determination from CDFW on the Biological Opinion. The Smelt Working Group (SWG) meets weekly from late November onward. The results of the September 2014 Fall Midwater Trawl are not yet available. The 2014 CDFW Summer Tow Net Survey conducted in June, July, and August observed Delta Smelt in the western Delta, Grizzly Bay and the Cache Slough-Sacramento Deepwater Ship Channel area. No Delta Smelt were found in the central and south Delta.
3. Longfin Smelt: DWR operates to the 2009 Longfin Smelt Incidental Take Permit (ITP) issued by CDFW. In WY2014 Longfin Smelt were only observed at the salvage facilities during February-April. Salvage data from WY1994 through WY2014 indicate that the average date when the first 5% of total yearly salvage occurred was February 7, and that salvage of any Longfin Smelt prior to December occurred in only one year during the past 21 years (WY2001). The most recently available monitoring data indicate that the majority of Longfin Smelt appear to be currently distributed in the Western Delta and the San Francisco Bay with lower densities distributed in Suisun Bay, and in the lower Sacramento River. The CDFW through the SWG tracks distribution and salvage to assess risk and make appropriate operational recommendations consistent with the Longfin Smelt ITP.

D. Temporary Urgency Change Petition (TUCP) Order: On October 7, the Executive Director of the SWRCB issued an Order Modifying an Order that Approved a Temporary Urgency Change in License and Permit Terms and Conditions Requiring Compliance with Delta Water Quality Objectives in Response to Drought Conditions. Orders issued in response to the TUCP filed by DWR and Reclamation modified certain conditions in Water Right Decision-1641 (D-1641) relative to maintaining various water quality objectives. Primarily, the October 7 Order modified the requirements in the water right permits to meet San Joaquin River flow requirements at Airport Way Bridge, Vernalis, during a 31-day period October to November 2014, and a 31 day average of 800 cfs in response to drought conditions.

### **III. Projected Hydrology**

California has the most varied annual precipitation of all states in the country, which creates major challenges to forecasting water project operations. Precipitation in the northern Sierra Nevada has ranged from a high of 88.5 inches in WY1983 to a low of 17.1 inches in WY1924. There are no strong climatological signals that would indicate any reliable certainty about the amount of precipitation to occur in the coming year, so there is reason to believe the entire range of precipitation variation is possible in WY2015.

Although precipitation varies each year, there is no doubt that the existing conditions of the basin after 3 years of drought in the form of low surface storage, depleted groundwater basins, and parched soil moisture will skew any resulting runoff to drier than historical averages for the given amount of precipitation that is ultimately observed. Until the first runoff estimates based on observed precipitation, base flow, and snowpack over the first third of the water year are developed in January 2015, historical exceedances of runoff will be relied upon for forecasting water operations – with the dry scenarios warranting greater weight than normal.

Historical hydrological exceedance patterns used in monthly time step operations models are averaged among a band of multiple historical years to give general guidance for annual water delivery, storage management, and power planning purposes for a given exceedance assumption. Actual hydrologic events act in time steps shorter than a month and are often unpredictable more than a few days to a week out. Day-to-day operations are driven by operating criteria such as those found in USACE flood control manuals, D-1641, and the Biological Opinions. Output from forecast models as provided in this Plan represent system responses to the overlay of these very specific operating criteria on a generic set of hydrologic scenarios.

### **IV. Other Forecast Assumptions**

In addition to the generic hydrologic assumptions of precipitation that contribute to the system, the Project operators must make some assumptions on other non-project consumptive uses of water.

#### A. Delta Consumptive Use

The forecasted operations use DAYFLOW assumptions of Delta consumption use, which are coarse monthly assumptions that do not vary by hydrology. Actual real-time diversions can vary significantly from those assumptions depending on actual precipitation and air temperatures. For example, DWR estimates that Delta consumptive use in January 2014 was much greater than these assumptions, based on DSM2 hind cast modeling and observed salinity conditions. Although more refined assumptions on Delta consumptive use based on more recent land use surveys are available for use in DSM2 to support real-time management decisions, there is no direct measurement of Delta diversions, and estimates cannot fully replicate such measurements.

#### B. Feather River Settlement Contractors (FRSC) Diversions

Under the context of the ongoing drought, DWR and the FRSC have been meeting frequently and working cooperatively on estimated water deliveries during the traditional rice decomposition and managed wetland flood up period (October through January) in an effort to balance uses for waterfowl habitat/rice decomposition this fall and winter with possible critical needs in 2015.

Under the 90% hydrological scenario expectations are for decreased deliveries during this period by approximately a third from those delivered in the recent past. Expectations are for additional reductions under drier 99% hydrologic conditions should they persist through the winter. If there is a significant improvement in hydrology as demonstrated under the 50% exceedance hydrology study, more typical levels of diversion are assumed to occur.

It is estimated that the reduced diversions in the fall will nevertheless double the projected flooded lands serving as habitat for migratory waterfowl in the Sacramento Valley this fall and winter mitigating the overall effect of a major reduction and flooded lands valley wide.

### **V. Projected Storage, Releases, and Supplies**

The storage and flows under the 50%, 90%, and 99% hydrologic scenarios are included in Attachment 2. The 50%, 90%, and 99% exceedance scenarios were selected to show the likely ranges of hydrology for potential future conditions.

### **VI. Regulatory Overview**

Reclamation and DWR have been operating the federal CVP and the SWP pursuant to D-1641 as amended by an Order and Modified Orders issued in response to a TUCP filed with the SWRCB on January 29, 2014. To support the TUCP, Reclamation, DWR, CDFW, SWRCB, USFWS, and NMFS worked in collaboration to prepare a Drought Operations Plan to outline anticipated operations and actions from April to November 2014. The 2014 Drought Operations Plan (DOP) identified

modifications to D-1641 as well as specific real-time adjustments to targeted RPA Actions identified in the USFWS and NMFS Biological Opinions. The DOP is effective from April through November 15, 2014. The Order and Modified Order, and corresponding ESA/CESA coverage, remain effective through January 2015.

- A. Decision-1641 – The CVP and SWP have operated in conformance with the Order and Modified Order.<sup>1</sup> The 50%, 90%, and 99% hydrologic studies produced for this DCP suggest that all D-1641 standards (as modified) will continue to be met through the term of this plan, January 15, 2015, (see Attachment 3). However, under drier than 99% hydrology (as occurred with Sacramento Valley and Delta accretions in January of last year), or other unexpected events, the CVP and SWP may need to seek modifications to D-1641 associated with Delta Cross Channel gate operations to manage salinity in the central Delta.
  
- B. NMFS Biological Opinion – the CVP and SWP have operated in conformance with the Order, Modified Order, and the contingency planning provision as provided under RPA Action I.2.3C. Existing salmonid monitoring in the Delta this water year indicates no winter-run salmon have yet been observed this fall at Tisdale, and only one winter-run sized juvenile was observed on October 8 at Knights Landing. Current hydrology in the Sacramento watershed and catch trends at Red Bluff Diversion Dam for winter-run sized juvenile Chinook are similar to last year. Barring a considerable precipitation or flow event (i.e. a “first flush”), potential entrainment at the Federal and State fish facilities through mid-January is likely to be very low. The 50%, 90%, and 99% hydrologic studies suggest that the CVP and SWP would be able to meet requirements of the Biological Opinions. However, under drier than 99% hydrology (as occurred with Sacramento Valley and Delta accretions in January of last year), or other unexpected events, the CVP and SWP may need to seek adjustment to RPA Action IV.1.2 after December 1, 2014, as was the case last year to adjust Delta Cross Channel gate operations to manage salinity in the central Delta.
  - a. Last year’s Delta Cross Channel gate operation adjustment, which occurred during the first two weeks of February, was necessary to balance several competing benefits – including real-time Delta salinity management (which represented a risk to public health and safety), real-time fishery protections, and upstream reservoir storage management. The upstream reservoir storage was a resource that was later needed this past summer for temperature and flow management for fish protections and Delta salinity management for public health and safety as well as other beneficial uses in the Delta. If dry conditions occur this fall as occurred in early WY2014, DWR and Reclamation may need to request the ability to open the Delta Cross Channel gates at times to balance water quality and fishery protection needs, beginning as early as December 1.

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<sup>1</sup> The monthly average NDOI in August 2014 was lower than the D-1641 requirement by 22 cfs, as was reported to SWRCB. In response the Projects mitigated this by increasing the NDOI by more than 22 cfs above the requirement for the month of September.

- C. USFWS Biological Opinion - the CVP and SWP have operated in conformance with the Order, Modified Order the Biological Opinion and concurrence letters issued by FWS. No adult Delta Smelt were observed in salvage during WY2014 at the South Delta fish facilities, suggesting an extremely low level of entrainment. Taking into consideration the distribution, hydrological conditions, and the low projected levels of export pumping, adult Delta Smelt entrainment risk is expected to be low, with an increase in risk unlikely unless a “first flush” type event occurs. Delta Smelt larvae are not expected to be present in the Delta prior to January 15. Under the 50%, 90%, and 99% hydrology, the CVP and SWP anticipate operating within D-1641 and the existing 2008 Biological Opinion.
- D. CESA 2081 Permit - the SWP has operated in conformance with the Order, Modified Order, and findings in the DOP biological consultation. The current distribution and historical migration patterns indicate that adult Longfin Smelt are likely to migrate into the Central and South Delta during the time period covered by this Plan if outflow remains low. Hatching of larvae occurs in December through March. Under the 50%, 90%, and 99% hydrology, the SWP anticipates operating pursuant to the Consistency Determination issued for the Biological Opinion, and the Incidental Take Permit.

## **VII. Other Considerations**

Prior to November 1, DWR and Reclamation will convene a workgroup to analyze the hydrology, turbidity and operations in 2012 and 2013, to identify specific actions that can be taken in 2014 and 2015 to manage entrainment and optimize water supply. The conditions experienced in December and January of 2012/13 will provide information for the actions that DWR and Reclamation may take to avoid migration of smelts into the South Delta and consequent entrainment at the export facilities. In the event of a large runoff event on the Sacramento River after December 1, DWR and Reclamation will take steps to manage the movement of a turbidity plume into the South Delta to the extent possible. Hydrology, biological conditions and system operations will be discussed at SWG, DOSS, DCT, WOMT and RTDOT meetings, and DWR and Reclamation will take actions based on the recommendations provided by these groups.

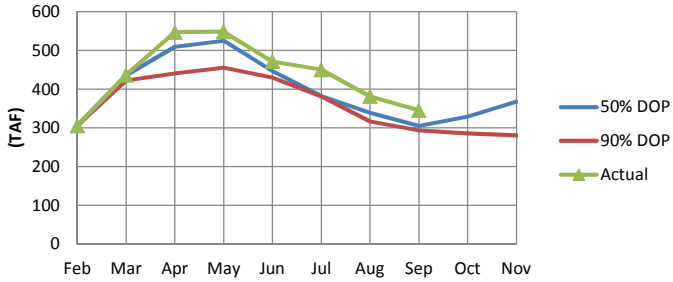


# ATTACHMENT 1

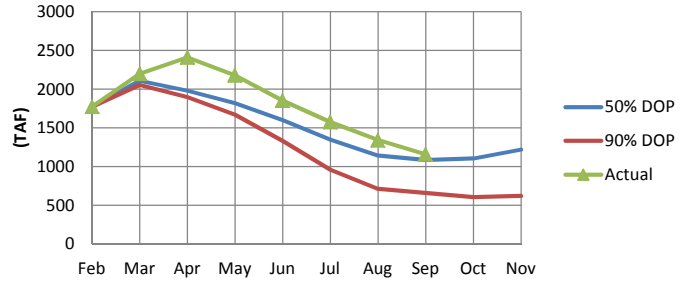
## April 2014 Drought Operations Plan

### Storage Tracking

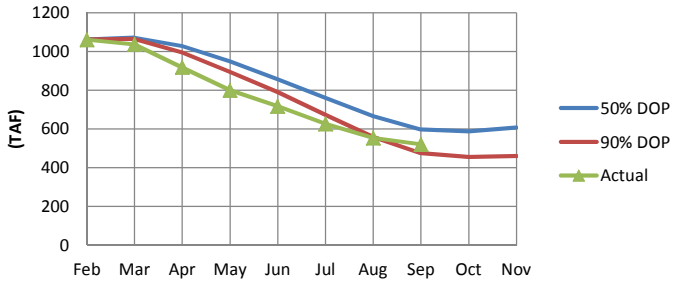
**Folsom Lake**  
(end-of-month storage)



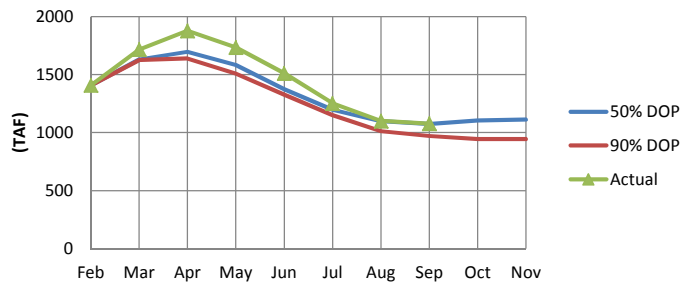
**Lake Shasta**  
(end-of-month storage)



**New Melones**  
(end-of-month storage)



**Lake Oroville**  
(end-of-month storage)



**ATTACHMENT 2**  
**DROUGHT CONTINGENCY PLAN**  
(October 1, 2014 - January 31, 2015)

RESERVOIRS	50% HYDROLOGIC EXCEEDENCE				90% HYDROLOGIC EXCEEDENCE				99% HYDROLOGIC EXCEEDENCE			
	2014			2015	2014			2015	2014			2015
	OCTOBER	NOVEMBER	DECEMBER	JANUARY	OCTOBER	NOVEMBER	DECEMBER	JANUARY	OCTOBER	NOVEMBER	DECEMBER	JANUARY
	END OF MONTH STORAGES (TAF)				END OF MONTH STORAGES (TAF)				END OF MONTH STORAGES (TAF)			
Trinity	563	557	594	656	581	547	530	535	552	516	507	493
Shasta	1116	1164	1367	1778	1076	1084	1154	1273	1046	1004	1004	1023
Folsom	356	376	414	488	316	295	295	306	287	236	205	205
Oroville	1036	1026	1089	1340	984	941	941	1047	973	909	900	913
New Melones	504	521	545	580	495	500	505	510	490	490	490	490

RIVERS	50% HYDROLOGIC EXCEEDENCE				90% HYDROLOGIC EXCEEDENCE				99% HYDROLOGIC EXCEEDENCE			
	2014			2015	2014			2015	2014			2015
	OCTOBER	NOVEMBER	DECEMBER	JANUARY	OCTOBER	NOVEMBER	DECEMBER	JANUARY	OCTOBER	NOVEMBER	DECEMBER	JANUARY
	MONTHLY AVERAGE RELEASES (CFS)				MONTHLY AVERAGE RELEASES (CFS)				MONTHLY AVERAGE RELEASES (CFS)			
Trinity	373	300	300	300	373	300	300	300	373	300	300	300
Sacramento	5009	4514	3269	3253	5009	4011	3269	3253	5009	4011	3269	3253
American	1106	1208	1252	1252	1106	1057	894	813	1106	1057	894	500
Feather	1187	973	960	960	1187	973	960	950	1187	973	960	950
Stanislaus	577	200	200	213	577	200	200	213	577	200	200	213

	50% HYDROLOGIC EXCEEDENCE				90% HYDROLOGIC EXCEEDENCE				99% HYDROLOGIC EXCEEDENCE			
	2014			2015	2014			2015	2014			2015
	OCTOBER	NOVEMBER	DECEMBER	JANUARY	OCTOBER	NOVEMBER	DECEMBER	JANUARY	OCTOBER	NOVEMBER	DECEMBER	JANUARY
	DELTA SUMMARY (CFS)				DELTA SUMMARY (CFS)				DELTA SUMMARY (CFS)			
Rio Vista Flows	3367	5433	10741		2744	3539	5722		2420	3069	4833	
Sac River at Freeport	7741	10086	13141	15304	6896	7518	7351	11603	6457	6881	6326	6638
SJ River at Vernalis	1691	1393	1350	1496	1334	1007	976	1057	960	604	585	960
Computed Outflow	5181	4996	7133	14530	4925	4995	4993	7478	4667	4493	5006	5255

**ATTACHMENT 3**  
**Bay-Delta Standards**  
**Contained in D-1641**  
**(with TUCP Order Modifications)**

CRITERIA	Oct 2014	Nov 2014	Dec 2014	Jan 2015
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**FLOW/OPERATIONAL**

<b>• Fish and Wildlife</b>				
<b>SWP/CVP Export Limits</b>				
<b>Export/Inflow Ratio</b>	65%			
<b>Minimum Outflow - mon.</b>	3000 cfs	3500 cfs	3500 cfs	4500 cfs
- 7 day average	2000 cfs	2500 cfs	2500 cfs	3500 cfs
<b>Habitat Protection Outflow, X2</b>				
<b>River Flows:</b>				
@ Rio Vista - min. mon. avg.	3000 cfs (2000 cfs)	3500 cfs (2000 cfs through Nov 15)	3500 cfs	
- 7 day average	2000 cfs (1500 cfs)	2500 cfs (1500 cfs through Nov 15)	2500 cfs	
@ Vernalis: Base -min. mon. avg.	(800 cfs avg for 31-day period)*			
- 7 day average				
Pulse objective	(Up to 28 TAF)			
<b>Delta Cross Channel Gates</b>			Close up to 45 days during Nov-Jan	

**WATER QUALITY STANDARDS**

<b>• Municipal and Industrial</b>				
<b>All Export Locations</b>	<= 250 mg/l Chlorides			
<b>Contra Costa Canal</b>	<= 150 mg/L Cl for 155 days ( 233 days met as of 9/21/2014 )			
<b>• Agriculture</b>				
<b>All Diversion Locations</b>	30 day running avg EC <= 1.0 mS/cm			
<b>• Fish and Wildlife</b>				
<b>Suisun Marsh Salinity</b>	19 mS/cm	15.5 mS/cm for Eastern / 16.5 for Western	15.5 mS/cm	12.5 mS/cm

\*Proposed

Water Year Classification: (Based on forecast, 05/01/2014)

SRI (40-30-30 @ 50%) = 4.0 MAF ( Critical )

SJI (60-20-20 @ 75%) = 1.1 MAF ( Critical )