California ISO

Stakeholder Comments Template

RA Enhancements

This template has been created for submission of stakeholder comments on the straw proposal part two that was published on February 28. The paper, Stakeholder meeting presentation, and other information related to this initiative may be found on the initiative webpage at:
http://www.caiso.com/informed/Pages/StakeholderProcesses/ResourceAdequacyEnhancements.aspx

Upon completion of this template, please submit it to initiativecomments@caiso.com. Submissions are requested by close of business on March 20.

Submitted by	Organization	Date Submitted
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CDWR appreciates the opportunity to provide comments on CAISO's RA Enhancements Phase II proposal. CAISO has historically respected the jurisdiction of California's Local Regulatory Authorities (LRAs), including CDWR and the CPUC, by allowing them to set their own counting criteria for their own RA resources. FERC has approved that framework.(*see, e.g., Cal. Indep. System Operator Corp.*, 119 FERC ¶ 61,076, P 555). CDWR believes that as an LRA, it is the entity best positioned to assess the capability of a unique resource—a coordinated hydroelectric and water delivery system that cannot easily be quantified by either historical performance or nationwide averages. CDWR's water delivery system is such a resource. If a different approach is taken, CDWR would ask that CAISO be open to discussions as to how that approach might be contoured to best work with CDWR's unique system.

Please provide your organization's comments on the following issues and questions.

1. Review of counting rules in other ISO/RTO's

Please provide your organization's feedback on this topic, described in Section 4.1. Please explain your rationale and include examples if applicable.

Based on the straw proposal, it appears that there is no single common method to determine unforced capacity (UCAP) value for a hydro resource among NYISO, PJM, MISO, and ISO-NE. NYISO uses previous 5 summer and winter capability periods to determine production factor that multiplies installed capacity (ICAP) value to calculate UCAP; PJM uses test results

performed annually to determine summer net capability and equates ICAP to UCAP; MISO uses ICAP (=UCAP) value determined based on most recent 3-15 years for peak hours and months; ISO-NE does not use UCAP values (expected outages are accounted for in the procured ICAP) and relies on performance credit or charge to incentivize resource performance.

Capability verification test: most of the ISOs use seasonal (summer and winter) capability period. For CDWR resources in its water delivery system, the capability varies by month depending on hydrology, water delivery needs, environmental constraints, among other factors.

Capability: most ISOs use seasonal capability. For CDWR resources in its water delivery system, capability varies by month based on the hydrology and water delivery needs.

Forced outages: ISOs use class average or blend of class average except ISO-NE which does not use forced outages. For CDWR resources in its water delivery system, non-planned outages within the month can occur not only due to plant equipment failures, but also due to lack of water delivery needs and other constraints such as environmental restrictions and dam water levels. It is difficult to predict or generalize such outages by applying class average forced outage factors.

UCAP value determination: Most ISOs use historical values in general. PJM uses summer net capability from tests taken annually during summer period (June-August) based on "expected" head and streamflow under summer conditions. For CDWR resources in its water delivery system, using historical values may not yield the desired result of reliable capacity to offer to CAISO market. Capability of CDWR's resource in water delivery system depend on current hydrology, water delivery needs, environmental constraints among other factors and the capability varies by month as the water delivery varies by month also. Therefore, there is no better way to determine CDWR's water delivery system resource capability than to use its current practice of determining qualifying capacity (QC) based on the most recent forecast of loads and resources driven by water delivery requirement; please refer to the "additional comments" section below for further information.

Not all the hydro generating plants are run-of-the river, especially integrated power and water delivery system generating plants such as State Water Project. Downstream flow depends on the upstream generation, water demand, water delivery schedules, hydraulic linkage, and environmental constraints among many other factors. Those resources' real UCAP value may be accurately calculated based on the latest generation and water demands and delivery schedules than historical. For example, depending on the hydrology, and water demand, CDWR resources' available capacity forecast varies significantly from year to year and month to month. Currently CDWR uses capacity counting based on the most recent forecast of resource availability than historical. Variances between historical or seasonal UCAP values and the actual resource availability could be significantly high for CDWR. If CAISO were to adopt the proposed mechanism, there would likely be a need to create a different methodology for hydro resources in an integrated water delivery system such as State Water Project (SWP), which are not run-of-the river and for which generation is dependent on hydrology and water demand. The methodology the DWR LRA currently uses is best suited for making availability determinations for CDWR's unique resource, and CAISO continue to defer to LRA authority

for this reason, among others. For such resources UCAP values can be calculated for each month based on the monthly QC (equivalent to ICAP) value supplied by the LRA based on the best available information on hydrology and water demand. Because the updated NQC reflects long term planned outages and derates, there would be no need of historical forced outage considerations; therefore, it can be assumed that NQC=ICAP=UCAP. UCAP values should be updated similar to current NQC values as the updated information on hydrology and water demand becomes available. For hydro resources both PJM and MISO treat UCAP equal to ICAP.

2. Capacity counting and availability best practices

Please provide your organization's feedback on this topic, described in section 4.2. Please explain your rationale and include examples if applicable.

ISOs use class average or blend of class average except ISO-NE which does not use forced outages. For CDWR resources in its water delivery system, non-planned outages within the month can occur not only due to plant equipment failures, but also due to lack of water delivery needs and other constraints such as environmental restrictions and dam water levels. It is difficult to predict or generalize such outages by applying class average forced outage factors if an alternative to RAAIM is created based on average forced outage rate.

3. RA counting rules and assessment enhancements

Please provide your organization's feedback on the following sub-section topics, described in section 4.3.

Please indicate any analysis and data review that your organization believes would be helpful to review on the this topic. Please provide details and explain your rationale for the type of data and analysis that you suggest.

a. Calculating NQC, UCAP, and EFC values topic, described in section 4.3.1.

The proposal states that leaving the NQC unchanged has the benefit of allowing the CAISO to maintain all the existing local capacity assessments and these assessments have worked well over time. CDWR supports CAISO proposal to not change the NQC methodology that exists today.

CAISO intends to add UCAP values in the RA process. CAISO has identified problems with the RAAIM mechanism. CAISO proposes to adopt the standard UCAP calculation similar to the approach applied by PJM. Specifically, the CAISO proposes to calculate UCAP as:
UCAP = (NQC) * (1 - EFORd)
However, PJM uses this method for thermal resources only. For hydro resources, PJM uses as UCAP as the ICAP. ISO is still exploring ways for calculating UCAP for hydro resources. For CDWR hydro resources in its water delivery system, UCAP should be based on the NQC values that is calculated based on the most recent available forecast of resources.

The CAISO is assessing the benefits of calculating the EFORd seasonally as is done in NYISO and MISO. The EFORd would be measured for January through April and October through December as one season and May through September as another season. It is difficult to figure out how applying class average EFORd will impact CDWR's resources in an integrated power and water delivery system. As such, similar to PJM, EFFORd should not be applied to hydro resources, therefore NQC should be equal to UCAP.

The CAISO proposes the following initial concept for consideration:
EFC = UCAP * (Percent of available capacity economically bid into the CAISO's market)
It is not clear if the percent of available capacity economically bid into the CAISO market is based on historical data on economic bid capability. If it is historical bid based, this method will prevent resources from providing flexible RA that are capable of offering economic bid but have self-scheduled because there was no need to offer economic bids. Also, it will be difficult to determine MW, hour and month for economic capacity bids in the past. If the resource offers flexible RA capacity, it should be the resource's responsibility to offer economic bid.

b. Determining System, Local, and Flexible RA requirements topic, described in section 4.3.2. Please explain your rationale and include examples if applicable.

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c. RA showings, supply plans, and assessments topic, described in section 4.3.3. Please explain your rationale and include examples if applicable.

In terms of operational needs and RA showings, the CAISO believes it is reasonable to expect that the amount of UCAP made available is sufficient to serve forecasted peak load and ancillary services requirements.
The CAISO proposes, consistent with the practice in certain other ISOs, that a resource's must offer obligation must be consistent with the resource's NQC value. If the NQC is greater than RA capacity for the month, the resource would not be able to sell its excess capacity because of MOO applied to all NQC capacity. If UCAP secures reliability by considering forced outages, why would all the available capacity need to be offered to CAISO market?
The proposal on footnote states, "Notwithstanding that, in most markets, capacity is procured and settled as UCAP, the resulting performance obligation on conventional controllable generation is to offer all of the ICAP except on recognized outages". It is not clear if the proposal is to apply NQC must offer obligation to all conventional generators only.

As part of this RA enhancements initiative, the CAISO is contemplating revisions to the bid insertion rules. CAISO is contemplating two options: bid insertion for all resources or no bid insertion at all. Bid insertion for use-limited resources will create problems for CDWR's resources that are hydraulically linked. The need for existing no bid insertion for hydro resources does not go away.

Use Limited Resource and MOO: CDWR is concerned that without specific details regarding how use-limited resources would interact with the new rules, it is difficult to fully understand the potential impacts. One particular concern is in regard to how ULRs would interact with the MOO requirement of NQC rather than designated RA capacity for the month.

d. Backstop capacity procurement topic, described in section 4.3.4. Please explain your rationale and include examples if applicable.

No comment.

4. Review of RA import capability provisions

Please provide your organization's feedback on the following sub-section topics, described in section 4.4.

Please indicate any analysis and data review that your organization believes would be helpful to review on the this topic. Please provide details and explain your rationale for the type of data and analysis that you suggest.

a. Maximum Import Capability Calculation review, described in section 4.4.1. Please explain your rationale and include examples if applicable.

Modification to allow releasing MIC for the month when the assigned capacity is unused may alleviate the concern of hoarding. CAISO may build a system to detect if the MIC has been used by the LSE for a particular month or not. Release should be limited for the month only if the LSE does not use for that month after initial allocation by ISO. LSE may still own the allocation for other months.

b. Available Import Capability Allocation Process review, described in section 4.4.2. Please explain your rationale and include examples if applicable.

Additional comments

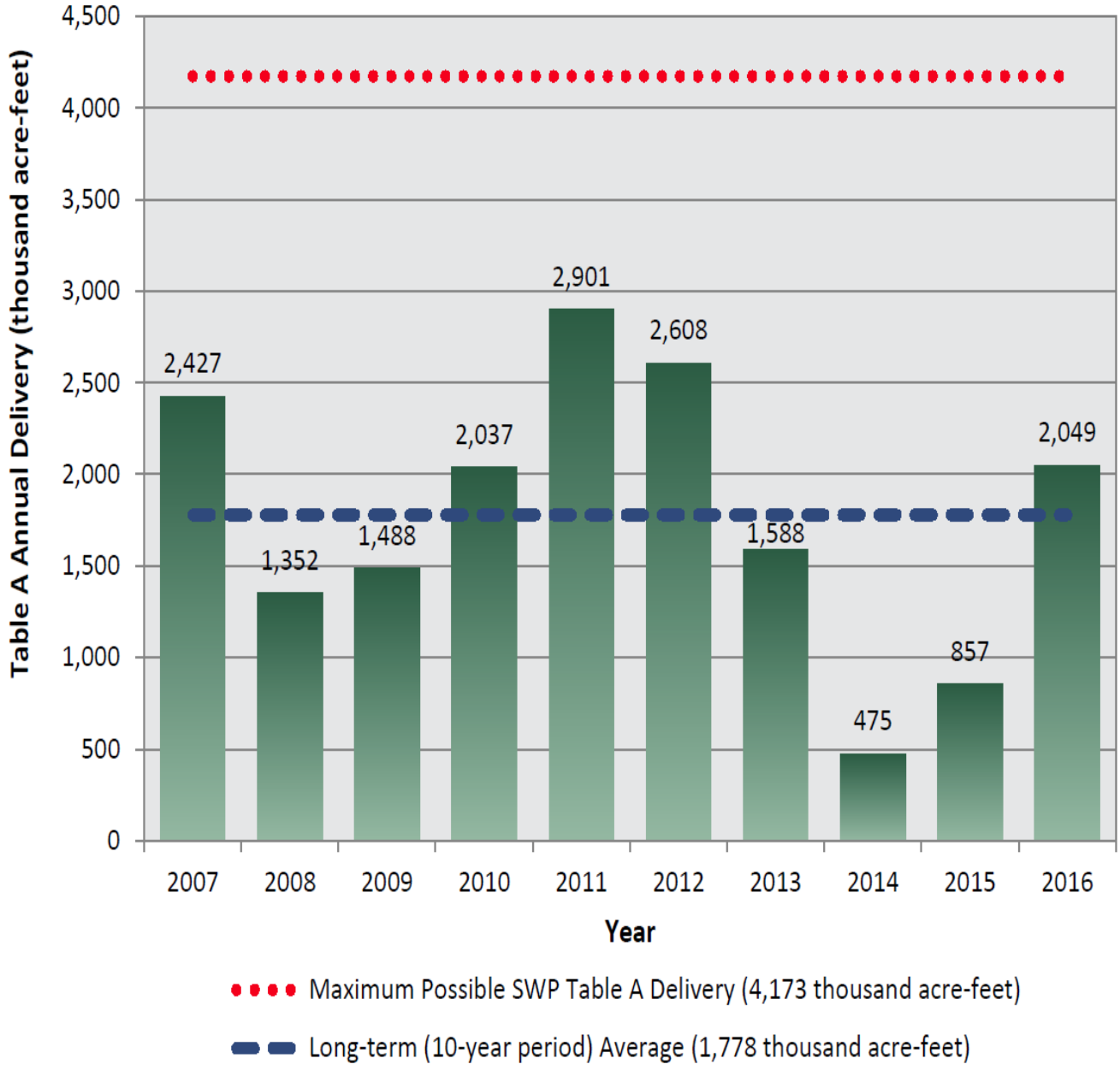
Please offer any other feedback your organization would like to provide on the RA Enhancements straw proposal – part two.

CDWR is providing following information in support of its uniqueness in operations which involves uncertainty in year to year and month to month water delivery and power requirements projections. The information provided here in support of CDWR's comments above is available publicly and the links are provided below.

Exhibit 1: the charts below show how water delivery can vary widely from year to year. Power primarily depends on the water delivery needs. The availability of these water supplies may be

highly variable. A sequence of relatively wet water years may be followed by a varying sequence of dry or critically dry years.

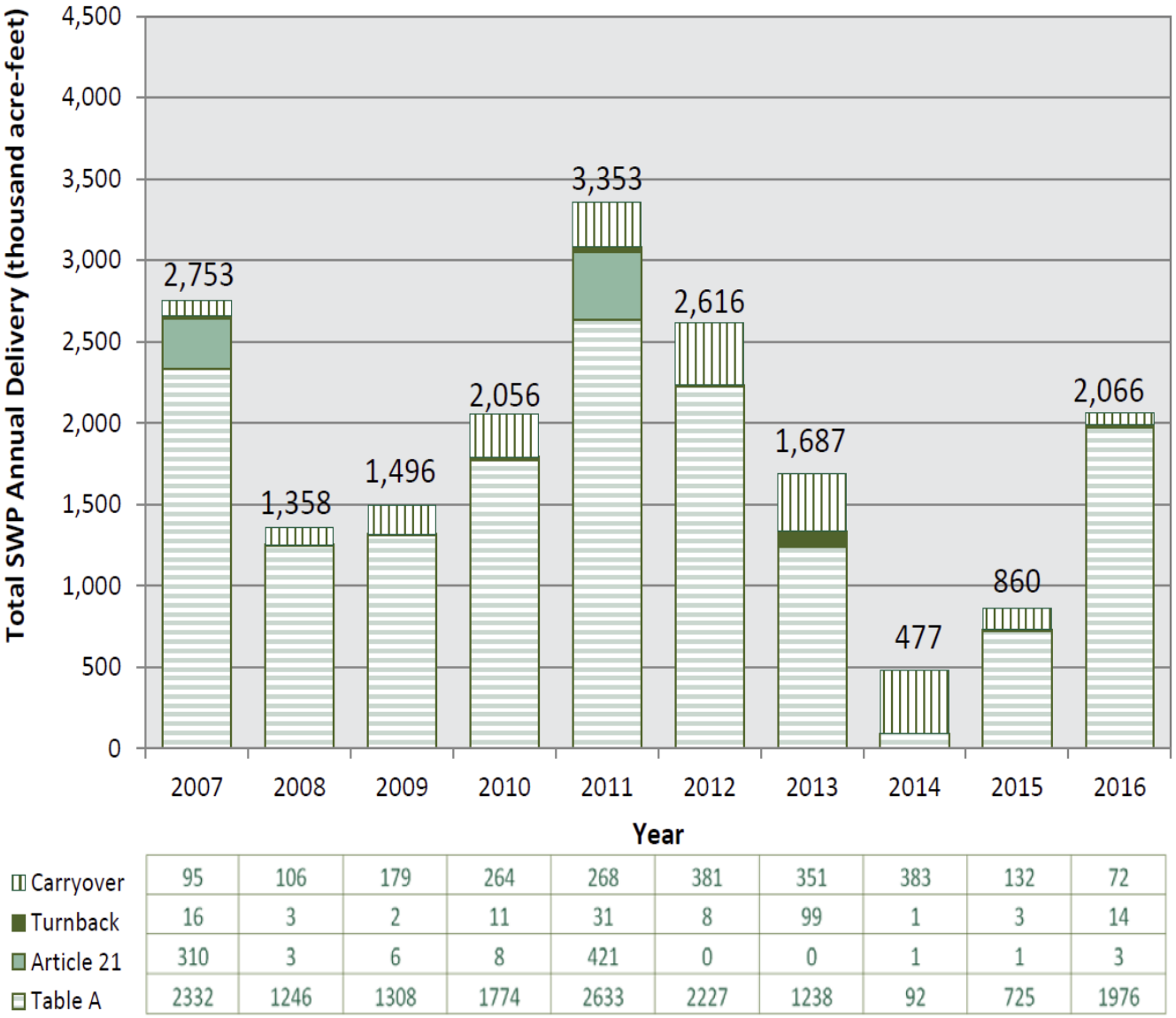
Historical Deliveries of SWP Table A Water, 2007–2016[1]



[1] *State Water Project Delivery Capability Report 2017*

http://baydeltaoffice.water.ca.gov/swpreliability/

Total Historical SWP Deliveries, 2007–2016 (by Delivery Type)



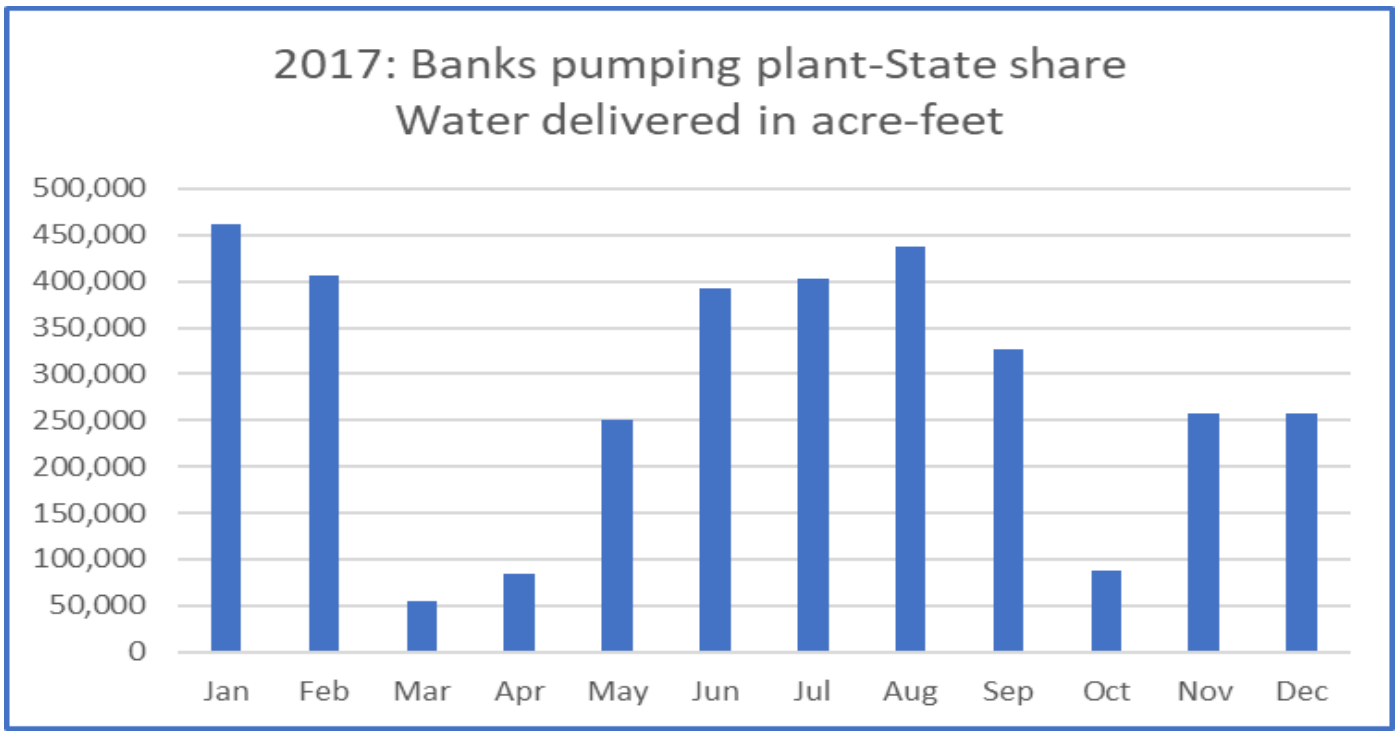
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Carryover	95	106	179	264	268	381	351	383	132	72
Turnback	16	3	2	11	31	8	99	1	3	14
Article 21	310	3	6	8	421	0	0	1	1	3
Table A	2332	1246	1308	1774	2633	2227	1238	92	725	1976

Exhibit 2: the chart below shows how water delivery through the Banks pumping plant can vary by month to month in the same year. Water delivered through Banks correlates with Oroville power generation, pumping and generating downstream[2]. All but five of the 29 SWP Contractors

[2] https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Operations-And-Maintenance/Files/Operations-Control-Office/Project-Wide-Operations/Annual-Reports-of-Operations/SWP-Annual-Report-2017.pdf

receive water deliveries by diversions from the Delta. These water diversions are pumped by either the Harvey O. Banks or Barker Slough pumping plants. DWR, and the United States Bureau of Reclamation (USBR), the managing entities of the two statewide systems of water transfer in California, face numerous challenges in the operation of their diversion facilities in the Delta, and are regulated by several state and federal agencies to maintain, and enhance the Delta's long-term sustainability. Maintaining suitable quality of water flowing in the channels of the Delta for the numerous in-basin beneficial uses, and the protection of endangered and threatened fish species, are important factors of concern for the operators of the Delta export diversion facilities. Ongoing regulatory restrictions, such as those aimed at protecting the estuary's resident and migratory fish species are major challenges to a reliable, and at the same time, sustainable water delivery capability of both, SWP and the CVP systems.

The chart uses 2017 annual report data on Banks pumping plant at the Delta.



SWP water delivery system generating plants' qualifying capacity depend primarily on the water delivery needs and they follow the pattern of water delivery year to year and month to month as shown by the charts above. ICAP and UCAP assessment based on generalized season and based on historical trends will be not be suitable for CDWR water delivery resources. There is wide variation of water delivery within the same season (for example: there is wider difference between January and March). The best approach for these resources would be to use the most recent forecasted availability and be updated as the new forecasts are available based on updated hydrology, and water demand among other factors. Therefore, for reliable available capacity (such as ICAP and UCAP) projection based on the most recent forecast of loads and resources is essential and should be allowed to be updated as it is done today for NQC.