

Technical Guidance

Delta Watershed Water Availability Analysis

Analytical Framework

This document provides technical guidance on the analytical framework for conducting a water availability analysis (WAA) to demonstrate water availability for applications within the Sacramento-San Joaquin Delta (Delta) watershed to support findings required by Water Code Section 1260, subdivision (k); Section 1375, subdivision (d); Section 1243, subdivision (a); and Section 1243.5. WAA methods vary on a case-by-case basis depending on project specifics. The intent of this document is to provide generalized guidance, not to preclude an applicant from conducting an independent analysis using an alternative approach. Applicants are strongly encouraged to consult with State Water Board Division of Water Rights (Division) staff before preparing a WAA.

The Division has developed a streamlined WAA approach applicable to a limited subset of applications for projects which provide groundwater recharge via diversion to underground storage and meet specific conditions, including limiting diversion season to the winter months and diverting only peak flows. More information on this streamlined approach is available [here](#).

Water Availability Analysis in the Delta Watershed

WAAs provide information to support California Water Code findings demonstrating the availability of water for a new appropriation, including consideration of the amount of water required to remain instream for public trust resources (e.g. fisheries, recreation) and compliance with water quality objectives. WAAs are generally comprised of two major steps: estimating unimpaired flow, and accounting for demand from senior diverters and instream flow / water quality objectives. General resources for performing WAAs for water rights permitting are available on the Division's website.¹ This document addresses how to structure WAAs in a way that accounts for considerations that are unique to the Delta watershed. Specific considerations related to supply and demand data are addressed in additional technical guidance, linked below. The Division has also developed a tool to assist applicants with WAAs in the Delta watershed, described in additional guidance linked at the bottom of this document (Technical Guidance on the Delta Watershed Spreadsheet Water Availability Analysis Tool).

The Delta watershed is made up of two major river systems—the Sacramento and San Joaquin—each with numerous tributaries, spans an area of more than 75,000 square miles, and encompasses more than 20,000 points of diversion (PODs) operated by more than 17,000 water right holders. The importance of the Delta watershed to California's water supply is reflected in the robust catalog of available climate and hydrologic datasets. WAAs should account for the scale of the Delta watershed and its hydrologic complexity while making use of the best available hydrologic data.



Geographic Scope

WAAs should account for upstream and downstream senior demand along the entire flow path of the proposed source stream. In the Delta watershed, this may mean considering senior diverter demand along hundreds of river miles, extending to the outlet of the Delta. Demonstrating that a proposed application may not impact senior diverters within the Legal Delta may also necessitate accounting for inflows from both the Sacramento and San Joaquin basins. In order to break the required analysis into manageable components, WAAs typically evaluate water availability at different geographic scales, such as within the immediate watershed, at the subwatershed scale (e.g. the Tuolumne River watershed or the Yuba River watershed), and at the Delta watershed scale, before combining the results from each analysis to create an integrated water availability finding. This approach allows the methods for each individual analysis to be tailored to available datasets. Demonstrating water availability in, for example, the month of February should show that the constraints at each scale are satisfied simultaneously.

Scenario Analysis

The intent of a WAA is to demonstrate that water will be available in the future to supply a proposed appropriation. In order to account for the potential range of future hydrologic and regulatory conditions, WAAs typically assess water availability under several scenarios. The range of regulatory and climate conditions to account for in a scenario analysis are discussed in additional guidance linked at the bottom of this document (Technical Guidance on Delta Watershed Water Availability Analysis Demand Considerations and Climate Scenario Analysis). Results from the various scenarios can be useful for scoping a project and understanding how project-yield may change over time (e.g. decreased diversion season). The Division is receptive to use of adaptive language in permit terms in cases where scenario analysis suggests significant differences in water availability under different future scenarios.

Interpreting Results

WAAs typically make use of historical hydrologic and diversion data as a proxy for representing future conditions. Results from such an analysis are not predictive (i.e. they don't relate to specific outcomes for specific future years) but can be illustrative when viewed in aggregate, often best thought of in terms of probability. Percent exceedance plots showing the percentage of years that water availability was shown to exceed a given volume can be a useful tool for communicating the results of a WAA. An example of a percent exceedance plot is shown in [Figure 1](#), below. In this example, subwatershed-scale WAA results under Scenario 4b suggest that some water will be available in 25% of years, 200 TAF or more will be available in 10% of years, 900 TAF or more will be available in 1% of years, and that the peak annual volume of available water is around 1,300 TAF (shown as having 0 percent exceedance in the WAA results dataset). Plotting Scenario 4b, which represents future climate conditions, against Scenario 4a, which represents current conditions, on the same chart highlights



expected shifts in water availability over time. The results shown in the figure would become inputs to a finer-scale analysis in which water availability would be further limited by infrastructure and operational constraints such as proposed maximum diversion rate or reservoir capacity.

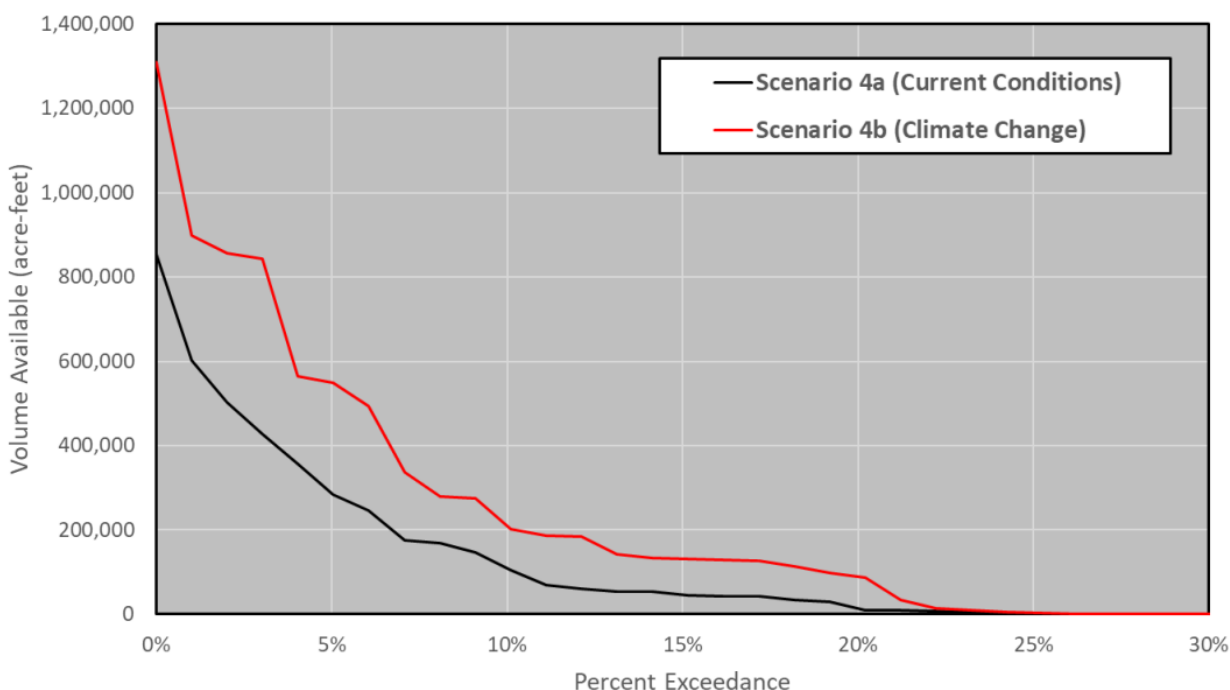


Figure 1 - Example percent exceedance plot for annual volume of water available for appropriation under scenarios representing current conditions and climate change

Additional Resources

[Technical Guidance on Delta Watershed Water Availability Analysis Climate Scenario Analysis](#)

[Technical Guidance on Delta Watershed Water Availability Analysis Demand Considerations](#)

[Technical Guidance on the Delta Watershed Spreadsheet Water Availability Analysis Tool](#)

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