



Putah South Canal Water Losses Management Study

The Solano County Water Agency (SCWA) is responsible for operating and maintaining the 33-mile long Putah South Canal (PSC) under an agreement with the Bureau of Reclamation. Canal inflows are measured at the canal head by a Parshall flume; discharges from canal turnouts are measured or estimated by various means, including meters, weirs and records of water sales. PSC losses are computed as the Parshall flume inflow minus the sum of water use by the various entities receiving water. Errors and inconsistencies in the records, particularly the discharge measurements and estimates, result in questionable estimates of canal loss.



The existing loss computation performed by the SCWA is based on the accounting of water used by the various agencies withdrawing water from the PSC rather than actual measurements of water flow at the various turnouts from the canal. For example, Solano Irrigation District (SID) takes water from the PSC at more than 50 locations, however, disregarding various exchange agreements, SID provides the SCWA with only two volumes of water received each month: (1) the agricultural entitlement used and (2) the M&I entitlement used. Using these 10 monthly volumes from eight water users to compute loss from the canal results in estimates of loss that often fluctuate wildly from month to month, sometimes even resulting in a gain (negative loss) at unlikely times of the year (e.g., June 2005). The main goal of this project was to develop a more consistent and defensible monthly loss estimate. A secondary goal was to assist in identifying reaches of the PSC that may be leaking.

A water balance methodology was developed for the entire PSC water conveyance system. This methodology can be disaggregated to obtain a reach by reach result. Initially, all possible inflows and outflows were included to be sure they have been considered. In performing a mass balance on the PSC, it is important to perform an uncertainty analysis on the various components in the mass balance equation. WEST performed an uncertainty analysis on the mass balance equation for the PSC. This uncertainty analysis gives the SCWA (1) the ability to improve the individual estimates in the mass balance equations, (2) the ability to quantify which variables contribute the greatest error to the final mass balance equations, and (3) the ability to determine which variables show the most potential for improving the accuracy of the mass balance equation.

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