



TECHNICAL MEMORANDUM

Date:	February 15, 2016
To:	Brett Ewart, City of Sacramento; Tom Gohring, Sacramento Water Forum
From:	Chris Hammersmark and Poyom Riles
Project:	14-1004 – Lower American River - Drought Year Analytical Support
Subject:	American River Low Flow Modeling at EAFWTP Intake

The recent drought, low flow rates and the subsequent low water levels in the American River have required the City of Sacramento to consider contingency plans to allow for continued extraction from the American River at the E. A. Fairbairn Water Treatment Plant (EAFWTP). Specifically if river levels fall below a defined threshold, additional submersible pumps will be required, or the intake facility will need to be modified. At the request of Dan Sherry of the City of Sacramento, cbec performed hydraulic modeling to estimate water levels in the American River at the location of the EAFWTP intake. The initial request was made in January 2014, when the US Bureau of Reclamation indicated the need to reduce the Nimbus Dam release rate from 1100 cfs down to 500 cfs or potentially lower.

A one dimensional HEC-RAS (RAS) model was previously developed by cbec for the Sacramento Water Forum to support various analyses related to the development of a Modified Flow Management Standard for the American River. The RAS model extends from the base of Nimbus dam to the confluence with the Sacramento River, utilizes cross sectional data that was last updated in 2009, and was calibrated/ validated using flow conditions present in 2008 and 2009. In this exercise, the RAS model was used to simulate 4 flow rates: 1100, 800, 500 and 250 cfs. Potential gains and losses of flow within the river corridor due to local inflow, evaporation, evapotranspiration, recharge or extraction were not simulated. Flow rates on the Sacramento River were assumed to be low, such that they do not affect the WSE at the EAFWTP intake. Due to the grade control that occurs downstream in the vicinity of Paradise Beach (River Mile 5), Sacramento River water levels only influence water levels in at EAFWTP when the Sacramento River flows are relatively high (i.e. during flood conditions). Table 1 provides a summary of the simulated water surface elevations (WSEs) for the flows simulated.

Table 1. RAS Predicted Water Surface Elevation at EAFWTP Intake

Flow Rate (cfs)	Water Surface Elevation (ft, NGVD29)	WSE Change Relative to 1100 cfs WSE (ft)
1100	12.66	-
800	12.11	- 0.56
500	11.55	- 1.12
250	10.79	- 1.87