

Quarterly Programmatic Report

Component Project Title: Downstream Tidal Exchange in DWSC
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CALFED Project 01-N61- 06
Quarter Ending March 31,2001

Deliverables

<u>Deliverable</u>	<u>Due</u>	<u>% Completed</u>	<u>Date Completed</u>
Task 1: Turner Cut Dye Study	10/30/01	64%	
Task 2: Water Quality Modeling	02/28/01	100%	
Task 3 Evaluate Tidal Exchange	6/30/02	54%	
3.1 Evaluate for range of flows			
3.2 Calibrate exchange in WQ Model			

Narrative

Overall Project

The planned Turner Cut dye study has been replaced with salinity (EC) surveys in the vicinity of Turner Cut. The Columbia Cut dye study has been replaced with preliminary water quality modeling of the 2001 data, as recommended by the TAC. Analysis of the historical EC data from the City of Stockton river stations R5 to R8 indicate that significant tidal exchange of water upstream of Turner Cut is only likely with DWSC flows of less than 500 cfs. Downstream tidal exchange is not likely to improve DO conditions at R5. Because the EC at R5 was always much higher than the EC at R7 or R8 during the very low flows in the summer of 1990 and 1991, periods of sustained reverse flows in the DWSC upstream past Stockton do not appear likely. The preliminary report was prepared for peer review and presented to the TAC. Modeling with the DSM2 and Stockton water quality model will proceed in the final quarter of the project.

Task 1 Turner Cut Dye Study

The dye studies that were originally proposed to evaluate this tidal mixing and exchange near Turner Cut were not conducted. Preliminary analysis of historical data from the City of Stockton river sampling stations and DWR's longitudinal DO surveys revealed that the electrical conductivity (EC) of the SJR provided a natural tracer that would more clearly illustrate the tidal exchange near Turner Cut.

Longitudinal EC profiles were measured during October 2001 to provide greater detail in the salinity gradient near Turner Cut. Measurements at high tide and low tide confirmed the tidal excursion near Turner Cut. Because DWSC flows during the period of these EC measurements were greater than 1,000 cfs, the salinity gradient was generally located downstream of Turner Cut. This confirms that the downstream tidal exchange will not affect DO concentrations upstream of Turner Cut if the DWSC net flow is greater than 1,000 cfs.

Tidal flow measurements have been combined with the DWSC geometry to provide estimates of the tidal excursion distance (between high and low tides) along the DWSC. This information is useful for evaluating the data collected by DWR and City of Stockton at fixed locations. The tidal excursion at the Rough and Ready station is about one mile. The tidal excursion at Turner Cut is 2 miles moving upstream and three miles moving downstream.

EC data from previous years (1991 and 1992 drought) have been used to confirm the tidal exchange. The preliminary report for peer review has been submitted to G. Fred Lee and Kevin Wolfe for posting on the website.

Task 2 Water Quality modeling of 2001 data

As recommended by the TAC, the 2001 data was modeled with the Stockton WQ model by Systech Engineering. This sub-contract and scope was prepared and the work has been completed by Systech. Results were presented to the TAC and a brief summary for the DO verification for 2001 appears in Systech's final report for the model improvements (2000 CALFED Grant). We are preparing a review of the field data to model input "conversion" that is necessary to estimate modeled inflow river concentrations for 2001. Sensitivity changes were also made to test the response of DO concentrations to flow, and inflowing BOD and a few key model coefficients. These results will also be summarized.

Task 3 Evaluate Tidal Exchange and Calibrate WQ Model

The model calibration work will be completed next quarter. The DSM2 model will be compared with the Stockton water quality model near the downstream end of the DWSC for tidal flows and mixing. The final report will be completed by May 31, 2002.

Fiscal Quarterly Report

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Total Estimated Cost: \$74,000
 CALFED Funding: \$74,000
 Other Funding: \$0
 Completion Date: 5/31/02

	Quarterly Budget			Annual Budget		
	Budget	Accrued	Balance	Budget	Accrued	Balance
Task 1: Turner Cut Dye Study		\$2,947		\$28,775	\$18,522	\$10,253
Task 2: WQ Modeling for 2001		\$20,910		\$20,925	\$20,910	\$15
Task 3: Evaluate Tidal Exchange and Calibrate Model		\$12,034		\$24,300	\$13,304	\$10,996
Total Project		\$35,891		\$74,000	\$52,736	\$21,264

Estimated Expenses for Next Quarter: \$21,000
 April: \$10,000
 May: \$10,000
 June: \$ 1,000 (Assumes extension approved)