

# Estimated Expenditures for Off-Stream Storage Feasibility Studies Authorized under Proposition 204 Funding

## Introduction

Chapter 6, Article 2 of the Safe, Clean, Reliable Water Supply Act of 1996 sets aside \$10 million for feasibility and environmental studies of off-stream storage upstream of the Delta, regional water recycling, water transfer facilities, and desalination.

The act does not specify how these studies are to be conducted, except to limit administration costs to no more than 3% of the total. In order to be useful however, these studies must be conducted in conformance with the current regulatory framework, and should be consistent with the comprehensive planning effort currently directed by the CALFED Bay-Delta Program.

The off-stream storage study should move in a logical and systematic way from a review of all potentially feasible sites to focusing on a small number of sites which can potentially achieve "storage and flood control benefits in an environmentally sensitive and cost-effective manner" (Section 78656 (a)).

As part of its Storage and Conveyance Component refinement Process the CALFED Bay-Delta Program has begun this process, by conducting a series of studies which provide the basis for efficiently narrowing the range of options for detailed evaluation. A portion of these studies provides the necessary technical framework for the feasibility studies and environmental studies authorized under Proposition 204, and thus the costs associated with that portion should be funded accordingly. CALFED expenditures attributable to this process began July 1, 1996 and will end November 30, 1997. They set the stage for detailed pre-feasibility and environmental studies of up to 3 off-stream storage sites upstream of the Delta, to be managed by DWR Northern District staff in close coordination with the CALFED Bay-Delta Program. The costs are estimated as follows: \_

### Estimated Costs, November 5, 1996 through June 30, 1997

#### Storage and Conveyance Component Inventory

Develop a comprehensive Storage and Conveyance Component Inventory, including on-stream and off-stream storage facilities upstream of the Delta, in the Delta, and associated with the export aqueduct systems reliant on Delta waters. A total of 94 components were inventoried, of which 8 were of off-stream storage components or their associated conveyance facilities upstream (and north) of the Delta. The inventory was developed by Bookman Edmunston Engineers under

Contract Task Order 1425-6-PD20-0341A/013. The Task Order fixed cost was \$351,678.18 of which \$263,609.12 was billed through October 25, 1996. The remainder of \$88,069 was pro-rated by a factor of 8/94. The pro-rated total attributable to off-stream storage upstream of the Delta was computed to be \$7495.

**Pre-feasibility Studies**

Conduct pre-feasibility engineering and environmental studies of the more promising storage and conveyance components. 23 Studies have been completed to date. Of these, 8 were of off-stream storage facilities or their associated conveyance facilities upstream of the Delta. The review of engineering reports and preparation of updated pre-feasibility evaluations was conducted by Bookman Edmunston Engineers under Contract Task Order 1425-6-PD20-0341A/013 Modification 2. The total fixed cost for Mod 2 was \$496,277.06. Subsequently under Modification 3 the total allocation was increased by an estimated \$39,000.03, and funds were shifted among the various tasks. As a result, a total of \$379,960 was allocated to pre-feasibility studies. This portion of the cost was pro-rated by the fraction 8/23 to arrive at the estimated cost of \$132,160 attributable to off-stream storage upstream of the Delta.

The preliminary environmental review for these 23 studies was conducted by DWR planning staff under a 1498. Total expenditures by DWR on this task was \$56,061, which was pro-rated by the fraction 8/23 to arrive at the estimated cost of \$19,499.

CALFED staff expended approximately 0.5 PY of effort to direct, provide technical input, review, and edit the prefeasibility studies, at an approximate cost of \$49440. The pro-rated cost is \$17197.

**DWRSIM System Evaluations**

Conduct system simulation studies to investigate the water supply and environmental benefits associated with off-stream storage and aqueduct storage facilities of various sizes, isolated Delta conveyance components, and groundwater storage components. Most of this work was conducted by DWR planning staff. Total cost incurred by DWR in modifying and running DWRSIM to conduct the CALFED component and alternative analyses since November 1, 1996 is \$188,284. In addition, DWR was supported by Surface Water Resources Inc. staff under Modification 2 and Modification 3 of Contract Task Order 1425-6-PD20-0341A/013. The total cost allocated to this task was approximately \$91,600, for a total of \$279,884.

The analyses include off-stream storage upstream of the Delta, in-Delta storage, aqueduct storage, an isolated conveyance component for the Delta, and groundwater storage north and south of the Delta. Existing code for modeling Los Banos Grandes Reservoir and Kern Water Bank addressed new aqueduct storage and south of Delta groundwater storage, leaving 4 new components. Most of the development effort has gone into refinement of DWRSIM features required to properly model current and proposed operational constraints and parameters. The

total DWRSIM modeling costs can be assumed to be split evenly among the new storage and conveyance features, and thus 1/4 is allocated to off-stream storage upstream of the Delta. The prorated cost is \$69,971.

### **Spreadsheet Post Processing Model Evaluations**

Conduct spreadsheet post-processing analyses of DWRSIM output to determine sensitivity of water supply and environmental benefits to diversion constraints, water supply targets, demands, and in stream flow targets. The first generation of the spreadsheet model was developed by CH2M Hill Staff under Contract Modification 2 and 3 of Contract Task Order 1425-6-PD20-0341A/013. The total fixed cost for Mod 2 was \$496,277.06. Of that amount, an estimated \$65,967 was allocated to spreadsheet analyses defined in Task 5. Subsequently under Modification 3 the total allocation was increased by \$39,000.03, and \$25,200 was shifted away from Task 5, leaving \$40,767. As a result, \$40,767 was allocated to spreadsheet post processing of DWRSIM system modeling runs. Approximately 80% of the costs allocated to Task 5 was devoted to development of this model and system evaluation of the four new system features described in the previous paragraph. The portion attributable to off-stream storage upstream of the Delta would be 1/4 of this amount, or \$8,153.

Subsequently, CALFED staff devoted approximately 0.66 PY's to developing and conducting evaluations with a second generation spreadsheet tool, which was used to evaluate two features: Off-stream storage upstream of the Delta and associated with the aqueduct system. The results were reported in CALFED Technical Progress Reports dated March 20, May 9, and May 12, 1997. The cost attributable to off-stream storage upstream of the Delta would be 1/2 of this amount, or \$36,300.

The combined cost attributable to off-stream storage upstream of the Delta would be the sum of the expenditures by CH2M Hill and CALFED staff, for a total of \$44,453.

### **Flood Control Evaluations**

Conduct preliminary evaluation of flood control benefits associated with off-stream storage in the Sacramento River basin under Contract Task Order 1425-6-PD20-0341A/013, Modification 2. The total fixed cost for Mod 2 was \$496,277.06. Of that amount, an estimated \$65,967 was allocated to spreadsheet analyses defined in Task 5. Subsequently under Modification 3 the total allocation was increased by \$39,000.03, and \$25,200 was shifted away from Task 5, leaving \$40,767. As a result, \$40,767 was allocated to spreadsheet post processing of DWRSIM system modeling runs, including preparation of a report which evaluated flood control benefits associated with off-stream storage upstream of the Delta. Approximately 20% of this evaluation was focused on this issue and the prorated cost is \$8153.

**Screening Process**

Staff has worked closely with Corps and EPA staff to develop a component screening process consistent with the Clean Water Act, Section 404(b)(1) alternatives analysis requirements. An interagency, multi disciplinary team has been established, with representation from the key resource and regulatory agencies, including the Corps and EPA. The process is currently underway. Only surface storage reservoirs have been considered in this process to date. Approximately \$79,547 of staff effort has been devoted to this process. Only surface storage reservoirs have been considered in this process to date. Of the 51 potential surface storage reservoirs considered, 8 are off-stream, north of Delta surface storage reservoirs. Accordingly, the pro-rated cost associated with the screening process to date is \$12,478.

**Summary**

The sum of the estimated costs for the period November 5, 1996 to June 30, 1997 is \$326,831.

**Estimated Costs, July 1, 1997 through November 30, 1997**

**Storage and Conveyance Component Inventory**

No additional activity is anticipated in the July 1 through November 30, 1997 time period.

**Pre-feasibility Studies**

CALFED's consultant team (Bookman Edmunston conducted pre-feasibility engineering and environmental studies of the more promising storage and conveyance alternatives, which were documented in draft reports submitted by June 30, 1997. During the July 1 through November 30, 1997 time period review comments provided by the Screening Committee as well as other interested parties will be incorporated into the draft reports. DWR staff will respond to comments on the biological resources and impacts. DWR engineering staff will review the engineering and cost calculations, and CALFED staff will take over report preparation and incorporation of comments. The estimated cost of these activities is \$151,244, which when pro-rated in accordance with the number of off-stream storage facilities in the list of pre-feasibility investigations (8/23), yields an attributable cost of \$52,606.

**DWRSIM System Evaluations**

It is assumed that DWR staff will continue to work at the same level of effort throughout the period July 1 through November 30, 1997 to incorporate modeling parameters associated with CVPIA implementation and CALFED's common program, the Ecosystem Restoration Program Plan, as well as testing and running the new program features in comprehensive alternative simulations. CALFED's consultant team (Surface Water Development Inc.) will provide technical support by assisting in reprogramming the model and verifying output accuracy. CALFED staff will provide technical input, coordinate study activities, and evaluate output. Total effort for these activities is estimated to cost about \$287,779, of which 1/4 is attributable to off-stream storage evaluation. The estimated cost is thus \$71,945.

**Spreadsheet Post Processing Model Evaluations**

No additional activity is anticipated in the July 1 through November 30, 1997 time period.

**Flood Control Evaluations**

No additional activity is anticipated in the July 1 through November 30, 1997 time period.

**Screening Process**

CALFED will continue to conduct the component screening process in close coordination with Corps and EPA staffs. The goal is to complete a Pre-application Consultation Report documenting the narrowing of storage components from the initial count of 51 storage facilities to about 3 facilities. These 3 facilities would be the subject of more detailed pre-feasibility studies conducted by DWR Northern District. Based on preliminary information developed during the CALFED inventory and screening process 3 likely candidates have been selected for further study in accordance with the requirements of Proposition 204. The estimated cost for completing the Pre-application Consultation Report is \$100,989, of which 8/51 is attributable to off-stream storage. Thus the estimated cost is \$15,841.

**Summary**

The sum of the projected costs for the period July 1, 1997 to June 30, 1997 is \$326,831.