



DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20310-2600

Exhibit: X-34

REPLY TO
ATTENTION OF

5 NOV 2002

CECW-PM (1105-2-10a)

SUBJECT: American River Watershed, California, Long-Term Study

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on flood damage reduction and ecosystem restoration improvements in the American River watershed in the vicinity of Sacramento, California. It is accompanied by the report of the district and division engineers. These reports are in partial response to Section 209 of the River and Harbor Act of 1962, Public Law 87-874, and in final response to Section 566 of the Water Resources Development Act (WRDA) of 1999, Public Law 106-53. Section 209 of the 1962 act authorized surveys for flood control for several localities including the Sacramento River basin, California. Section 566 of WRDA 1999 directed a study of increasing surcharge flood control storage at the Folsom Dam and Reservoir without an increase in conservation storage, and directed a study of all levees on the American River and on the Sacramento River downstream and immediately upstream of the confluence of such rivers to assess opportunities to increase potential flood protection through levee modifications. Preconstruction engineering and design activities for this project will be continued under the 1962 authority.

2. The reporting officers recommend authorization of a plan to reduce flood damages along the lower American River and to restore ecosystem function and values along portions of the lower American River. The major flood damage reduction component consists of raising the height of Folsom Dam by 7 feet. The raise would include a combination of raising the concrete monolith and embankments and adding a 3.5-foot parapet wall, replacing the spillway radial gates, modifying the spillway bridge piers, and replacing the spillway bridge. With these modifications, the top-of-flood-pool elevation at Folsom Reservoir would be increased from an elevation of 474 to 482 feet above mean sea level, and flood control storage capacity would be increased by 95,000 acre-feet. Significant work at Folsom Dam to address dam safety is avoided by also including modifications to the spillway at L. L. Anderson Dam owned by Placer County Water Agency (PCWA) and located on the Middle Fork of the American River. By including measures to widen the L. L. Anderson Dam spillway, the probable maximum flood (PMF) inflows to Folsom Dam would be lowered, thereby avoiding more costly dam safety work at Folsom Dam. Currently, the total project costs include the cost of the modifications to the L. L. Anderson Dam. The dam will remain under the ownership of PCWA. No additional operation or maintenance costs for L. L. Anderson Dam

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are expected to result from the implementation of the proposed project, and all current and future operation and maintenance costs for the dam will remain the responsibility of PCWA. The L. L. Anderson Dam spillway may be modified through existing, ongoing programs of the State of California Division of Safety of Dams or the Federal Energy Regulatory Commission. If so, the without-project condition would be adjusted accordingly and the spillway modifications included in the recommended plan would be reduced or eliminated.

3. Mitigation for project construction includes the planting of approximately 82.6 acres of oak woodland/blue oak-gray pine woodland, 10.3 acres of riparian woodland and 0.3 acre of seasonal wetland habitat on what are now grasslands. These lands are federally owned and no acquisition is required. In addition, an adaptive management plan would be implemented by the non-Federal sponsor to mitigate unforeseen effects on vegetation and wildlife due to the enlarged flood pool from 474 to 482 feet elevation. The recommended flood damage reduction improvements would remedy the existing safety deficiency at Folsom Dam and reduce the annual probability of flooding in Sacramento from an estimated 1-in-164 chance to a 1-in-213 chance in any year. The recommended plan also includes environmental restoration features that would provide for approximately 620 acres of wildlife habitat including wetlands, riparian, and native vegetation at the Woodlake and Bushy Lake sites along the lower American River parkway. In addition, temperature control shutters for the inlets to the Folsom Dam penstocks would be mechanized to better regulate the American River water temperature to increase native salmon and steelhead populations downstream of the dam.

4. The reporting officers indicate that based on October 2001 price levels, the estimated total first cost of the recommended plan is \$219,000,000. Approximately \$126,000,000 of the total first cost of the recommended plan is allocated between flood damage reduction and environmental restoration, about \$98,600,000 and \$27,400,000, respectively. Based upon the cost sharing requirements of WRDA 1986, the Federal share of project costs for flood damage reduction features is \$64,500,000 and the non-Federal share is \$34,100,000, and the Federal share of project costs for the environmental restoration features is \$17,800,000 and the non-Federal share is \$9,600,000. The remaining \$93,000,000 balance of the total first cost of the plan is for the dam safety requirements of the existing project. The allocation between flood damage reduction and dam safety costs is preliminary and was made using a modified "separable cost remaining benefit analysis" based on a reasonable cost estimate for a least-cost, dam safety fix of existing Folsom Dam. Further refinement of the cost allocation will be finalized based on the outcome of ongoing safety studies by the Department of the Interior, Bureau of Reclamation (the Bureau) and the State of California, and in consultation with the U.S. Army Corps of Engineers.

5. For this project, the Bureau will be responsible for the costs allocated to dam safety. The Bureau advises that timely implementation of the project will necessitate an increase in the

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authorization ceiling of its Dam Safety Program. Further, the Bureau advises that additional specific authorization may be required for the Bureau to participate in this proposed project.

6. To ensure that an efficient environmental restoration plan was recommended, cost effectiveness and incremental analysis techniques were used to evaluate alternative restoration plans. The cost of the recommended environmental restoration features is justified by the restoration of about 894 average annual habitat units and provides for achieving habitat increases in the most cost-effective manner. These restored habitats are considered especially valuable due to scarcity and dependence of certain species on these resources.

7. During Washington level review of the final feasibility report, concerns were raised on the structural stability of Folsom Dam, whether corrective measures are technically and engineeringly feasible, whether the estimate of project costs associated with the corrective measures was accurate, and to what extent these additional costs could change the analysis of alternatives and the selection of the recommended plan. An independent technical evaluation of the Folsom Dam 7-foot raise project, reaffirmed to a great extent, the stability analysis done by the reporting officers during the feasibility study. However, recognized experts in dam safety analysis recommended an increase in construction contingencies for the recommended Folsom Dam 7-foot raise project, and also proposed additional analyses and investigations on the sliding and rotational stability of certain dam monoliths to ensure adequate factors of safety for the existing Folsom Dam and the proposed 7-foot raise project. A subsequent Special Analysis of the Folsom Dam Seven Foot Raise project conducted by Corps staff recommends that the reporting officers recommended plan be modified with the addition of the following features: drain improvements and instrumentation, drilled caissons and concrete toe buttresses. With these modifications, the proposed project is technically feasible and structurally sound. Based on October 2001 price levels, the modified recommended plan is estimated at \$248,600,000. Approximately \$155,600,000 of the total first cost of the recommended plan is allocated between flood damage reduction and environmental restoration, about \$128,200,000 and \$27,400,000, respectively. The remaining \$93,000,000 balance of the total first cost of the plan is for the dam safety requirements of the existing project. The allocation between flood damage reduction and dam safety costs is preliminary and was made using a modified "separable cost remaining benefit" analysis" based on a reasonable cost estimate for the least-cost, dam safety fix at Folsom that would be expected as part of the without-project condition. This cost allocation will be finalized based on more detailed studies during preconstruction engineering and design (PED) by the Department of the Interior, Bureau of Reclamation, the State of California, and the Corps. Also, the Special Analysis of Folsom Dam Seven Foot Raise report concludes that there will be no adverse environmental impacts associated with the construction of the structural improvements. During PED, further environmental studies will be conducted to reaffirm this finding.

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Based upon the cost sharing requirements of WRDA 1986, the Federal share of project costs for flood damage reduction features is \$83,300,000 and the non-Federal share is \$44,900,000, and the Federal share of project costs for the environmental restoration features is \$17,800,000 and the non-Federal share is \$9,600,000. The \$93,000,000 dam safety cost will be the responsibility of the Bureau of Reclamation as stated above.

8. As non-Federal sponsors of the flood control features, the State of California Reclamation Board and Sacramento Area Flood Control Agency would be responsible for the annual cost of operation, maintenance, repair, replacement and rehabilitation (OMRR&R) of the flood damage reduction components, a cost currently estimated at \$200,000. As non-Federal sponsor for the environmental restoration features, the Sacramento Area Flood Control Agency would be responsible for the annual OMRR&R cost for the environmental restoration features, a cost currently estimated at \$560,000. The Bureau currently manages, operates and maintains Folsom Dam and will continue to do so in the future. The non-Federal sponsors will enter into an agreement with the Bureau to pay for any additional OMRR&R associated with the flood damage reduction and environmental restoration features of this project. The agreement between the Bureau and the non-Federal sponsors must be executed prior to execution of the project cooperation agreement (PCA).

9. Based on a discount rate of 6.125 percent amortized over 50 years and including annual OMRR&R, average annual flood damage reduction costs, including measures to strengthen Folsom Dam, are estimated at \$10,200,000. Average annual flood damage reduction benefits attributable to the plan are estimated at \$19,200,000, and the flood damage reduction benefit-to-cost ratio is 1.9 to 1.0. The net annual flood damage reduction benefits for this plan are \$9,000,000. Within the scope of measures defined by Section 566 of WRDA 1999, the recommended flood damage reduction features provide the highest net flood damage reduction benefits compared to all Folsom Dam enlargement and downstream levee modification alternatives considered. The cost of the additional structural improvement features at Folsom Dam does not change the analysis of alternatives and the selection of the recommended plan contained in the final feasibility report.

10. The first cost of the recommended optimal flood damage reduction features/national ecosystem restoration (NER) Plan is estimated at \$261,200,000. The recommended plan is not the combined scoped optimal flood damage reduction features/NER plan. The recommended plan is similar to the scoped optimal flood damage reduction features/NER plan except that the recommended plan does not include \$12,600,000 for two of the separable environmental features included in the NER plan.

11. I concur in the findings, conclusions, and recommendation of the reporting officers. Accordingly, I recommend that flood damage reduction and environmental restoration improvements for the American River Watershed, California, Long-Term Study project be authorized generally in accordance with the reporting officers' recommended plan, as further

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modified in accordance with the recommendations of the Special Analysis of Folsom Dam Seven Foot Raise report. My recommendation is subject to cost sharing, financing, and other applicable requirements of Federal and State laws and policies including Public Law 99-662, WRDA 1986, as amended, and in accordance with the following requirements, which the non-Federal sponsors must agree to prior to project implementation:

a. Provide a minimum of 35 percent, but not to exceed 50 percent, of total project costs allocated to structural flood damage reduction and provide 35 percent of total project costs allocated to environmental restoration as further specified below:

(1) Enter into an agreement which provides, prior to execution of the project cooperation agreement, 25 percent of design costs;

(2) Provide, during construction, any additional funds needed to cover the non-Federal share of design costs;

(3) Provide, during construction, a cash contribution equal to 5 percent of total project costs allocated to structural flood damage reduction;

(4) Provide all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform or assure the performance of all relocations determined by the Government to be necessary for the construction, operation, and maintenance of the project;

(5) Provide or pay to the Government the cost of providing all retaining dikes, wasteweirs, bulkheads, and embankments, including all monitoring features and stilling basins, that may be required at any dredged or excavated material disposal areas required for the construction, operation, and maintenance of the project; and

(6) Provide, during construction, any additional costs as necessary to make its total contribution equal to at least 35 percent of total project costs allocated to structural flood damage reduction and 35 percent of total project costs allocated to environmental restoration.

b. Give the Government a right to enter, at reasonable times and in a reasonable manner, upon land which the local sponsor owns or controls for access to the project for the purpose of inspection, and, if necessary, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the project.

c. Assume the responsibility for paying for the OMRR&R of flood damage reduction and environmental restoration project features. The Bureau currently manages, operates and maintains Folsom Dam and will continue to do so in the future. The non-Federal interest will enter into an agreement with the Bureau to pay for any additional OMRR&R associated with the flood damage reduction and environmental restoration features of this project. The

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agreement between the Bureau and the non-Federal sponsor must be executed prior to execution of the project PCA.

d. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended, and Section 103 of the Water Resources Development Act of 1986, Public Law 99-662, as amended, which provides that the Secretary of the Army shall not commence the construction of any water resources project, or separable element thereof, until the non-Federal sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element.

e. Hold and save the Government free from all damages arising from the construction, operation, maintenance, repair, replacement, and rehabilitation of the project and any project-related betterments, except for damages due to the fault or negligence of the Government or the Government's contractors.

f. Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project to the extent and in such detail as will properly reflect total project costs.

g. Perform, or cause to be performed, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601-9675, that may exist in, on, or under lands, easements or rights-of-way necessary for the construction, operation, and maintenance of the project; except that the non-Federal sponsor shall not perform such investigations on lands, easements, or rights-of-way that the Government determines to be subject to the navigation servitude without prior specific written direction by the Government.

h. Assume complete financial responsibility for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-of-way that the Government determines necessary for the construction, operation, maintenance, repair, replacement, or rehabilitation of the project.

i. Agree that, as between the Government and the non-Federal sponsors, the non-Federal sponsors shall be considered the operators of the project for the purposes of CERCLA liability and, to the maximum extent practicable, shall operate, maintain, repair, replace, and rehabilitate the project in a manner that will not cause liability to arise under CERCLA.

j. Prevent obstructions of or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) which might reduce the ecosystem restoration, the level of protection the project affords, or hinder operation and maintenance of the project, or interfere with its proper function, such as any new development on project lands or the addition of facilities which would degrade the benefits of the project.

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k. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR, part 24, in acquiring lands, easements, and rights-of-way, and performing relocations for construction, operation, and maintenance of the project, and inform all affected persons of applicable benefits, policies, and procedures in connection with said act.

l. Comply with all applicable Federal and State laws and regulations, including Section 601 of the Civil Rights Act of 1964, Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army," and Section 402 of the Water Resources Development Act of 1986, as amended, which requires that non-Federal interests develop and implement a floodplain management plan.

m. Provide the non-Federal share of that portion of the costs of mitigation and data recovery activities associated with historic preservation that are in excess of 1 percent of the total amount authorized to be appropriated for the project, in accordance with the cost sharing provisions of the PCA.

n. Participate in and comply with applicable Federal floodplain management and flood insurance programs.

o. Inform affected interests, at least annually, regarding the limitations of the protection afforded by the project.

p. Provide and maintain appropriate access roads, parking areas, and other public use facilities.

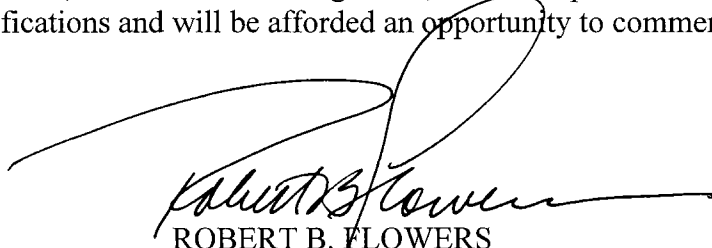
q. Do not use Federal funds to meet the non-Federal sponsors' share of total project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is authorized.

12. The recommendation contained herein reflects the information available at this time and current departmental policies governing formulation of individual projects. It does not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program nor the perspective of higher review levels within the executive branch. Consequently, the recommendation may be modified before it is transmitted to the Congress

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as a proposal for authorization and implementation funding. However, prior to transmittal to the Congress, the sponsors, the State, interested Federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.

A handwritten signature in black ink, appearing to read "Robert B. Flowers". The signature is fluid and cursive, with a large loop at the end.

ROBERT B. FLOWERS
Lieutenant General, U.S. Army
Chief of Engineers