AMERICAN RIVER WATERSHED, CALIFORNIA
FOLSOM DAM MODIFICATION PROJECT

404(b)(1) WATER QUALITY EVALUATION

I. PROJECT DESCRIPTION

LOCATION

The project area is located in the American river Basin and includes Folsom Dam and Reservoir and the land areas immediately adjacent to the reservoir, Lake Natoma, and the lower American River channel. Folsom Dam and Reservoir are located about 25 miles east of the city of Sacramento. Folsom Dam and Reservoir are a multipurpose water project constructed by the Corps of Engineers and operated by the Bureau of Reclamation as part of the Central Valley Project. The reservoir provides flood protection for the Sacramento area; water supply for irrigation, domestic, municipal, and industrial uses, and hydropower. The reservoir also provides extensive water-related recreational opportunities, water quality control in the Delta, and maintenance of flows stipulated to balance anadromous and resident fisheries, wildlife, and recreational considerations in and along the lower American River.

GENERAL DESCRIPTION

The proposed action consists of enlarging the eight existing river outlets and modifying the use of surcharge storage space. Activities that could result in placing fill into waters of the United States are described in this 404(b)(1) evaluation. For a complete description of the proposed action please see section 2.2.2 in the Environmental Assessment/Initial Study.

The existing outlets will be enlarged by controlled blasting. Watertight bulkheads would then be bolted over the inlets to allow excavation in the dry. Before enlarging the outlets, approximately 30,000 cubic yards of sediment that has accumulated upstream of Folsom Dam must be removed in order to enlarge the outlets. This material is likely a combination of coarse and fine grain material. This material would be removed during the winter (November through February) of several construction years. Three dredging cycles are anticipated. The initial work will remove 20,000 cubic yards and an additional 5,000 cubic yards may need to be removed in the following two construction seasons if flood flows re-deposit a substantial amount of sediment in the affected area. The initial dredging operation will take 40 to 60 working days. The follow-up dredging cycles, if needed, would take 10 to 20 days working days. This estimate is based on removing 400 cubic yards per day over a 10-hour workday

Dredging will be included in the main construction contract, which is scheduled to be awarded in the summer of 2002. The first outlet to be enlarged would be on the upper level, so sediment removal will not be needed during the 2003 construction season. The lower level outlets would be enlarged in 2004, 2005, and 2006. The dredging operation would be scheduled

as follows:

November 2003 through February 2004 – dredge 20,000 cubic yards
November 2004 through February 2005 – dredge 5,000 cubic yards
November 2005 through February 2006 – dredge 5,000 cubic yards

The staging area for this work will be at the Folsom Dam overlook parking lot. (See plate 1.) A temporary construction road would be graded from the parking lot out to a flat area of the lakebed. This area is likely to remain exposed during the winter flood season. On the lakebed, a containment area would be graded to hold the dredge material while it dries. The containment area would be about 10 acres in size and enclosed with either a four and one half foot earthen dike, or geotechnical logs.

Transport of the excavated material would be by barge. The barges would be assembled at the lakebed work site and pulled over to the upstream face of Folsom Dam. Either a suction dredge or a light clamshell dredge would be used to remove the fine grain sediment. For the coarser material a traditional clamshell bucket with welded plates to reduce spillage would be used. The sediment would be placed on the barges and transported to the nearby containment area. Excess water would be pumped back into Folsom Lake.

Pre-dredge samples will be taken to determine if the material is below inert waste levels. If the material is below inert waste levels then it will be left in place and worked back into the lakebed. If the material is above inert waste levels then it will be transported off site to a nearby landfill.

In the event that the material must be removed from the site, a maximum of 25 truckloads per day would be needed to remove the initial 20,000 cubic yards over the 40 to 60 days of operation. Removal of the 5,000 cubic yards of follow-up dredging, if necessary, would require the same number of truckloads and 10 to 20 days of effort.

Following dredging and enlargement of the lower outlets, any over-excavated areas would need to be filled with a dental concrete. The dental concrete would be pumped underwater and hand placed by a diver. This type of concrete contains an additive that allows it to cure underwater. A maximum of 15 cubic yards of dental concrete would be necessary.

AUTHORITY AND PURPOSE

The purpose of the proposed action is to increase flood protection to the American River flood plain. Modifications of Folsom Dam were authorized by the Water Resources Development Act of 1999 (Public Law 106-53), which reads in part:

"The Folsom Dam Modification portion of the Folsom Modification Plan described in the United States Army corps of Engineers Supplemental Information Report for the American River Watershed Project, California, dated March 1996, as modified by the report entitled "Folsom Dam Modification Report, New Outlets Plan", dated March 1998,

prepared by the Sacramento Area Flood Control Agency, at an estimated cost of $150,000,000, with an estimated Federal cost of $97,500,000 and an estimated non-Federal cost of $52,500,000. The Secretary shall coordinate with the Secretary of the Interior with respect to the design and construction of modifications at Folsom Dam authorized by this paragraph."

GENERAL DESCRIPTION OF DREDGED OR FILL MATERIAL

The sediment removed from upstream of the dam is a combination of both coarse and fine material. A maximum of 30,000 cubic yards needs to be removed. This sediment that has accumulated behind the dam is a result of normal erosional processes upstream of Folsom Dam. The dental concrete that would be placed in the over excavated areas is from a commercial source. Although excavation plans have not been finalized, we estimate that about 15 cubic yards of dental concrete will be necessary.

DESCRIPTION OF PROPOSED DISCHARGE SITE(S)

Plate 1 shows the approximate area behind Folsom Dam where dredging would take place. This area is relatively limited in size and is in open water. The containment area for the dredge disposal is located in an upper portion of the lakebed as shown on plate 1.

DESCRIPTION OF DISPOSAL METHOD

Dredging could result in some resuspension of sediment in the water column. The dental concrete would be placed at the base of the upstream side of the dam wherever over excavation of bedrock material is necessary. A containment area would be constructed within the lakebed as shown on plate 1. Dredge material would be placed here to dry. If the dredge material is determined to be biologically inert, then it would remain on the lakebed. If the material is not inert, then it will be transported to a nearby landfill.

II. FACTUAL DETERMINATIONS

a. Physical Substrate Determinations

(1) Substrate Elevation and Slope. The substrate elevation and slope would be modified slightly with the removal of sediment that has accumulated next to the dam The containment pond constructed to dry the sediment will be located on a flat area of the lakebed.

(2) Sediment Type. Sediment removed by dredging appears to be a combination of both coarse and fine grain material.

(3) Dredged/Fill Material Movement. The dental concrete material used to backfill any over-excavated areas would not be susceptible to erosion or movement when it has cured. Dredging activities to remove accumulated sediment from the upstream face of the dam

would result in the temporary resuspension of material in the water column. Dredge material would be placed in a containment area and when dry would be integral with the lakebed.

(4) Physical Effects on Benthos. The benthic community in the immediate area of the sediment removal would be removed. This community is probably fairly simple and does not support an extensive or complex aquatic community. The benthic community would reestablish itself following sediment removal.

(5) Other Effects. Not Applicable.

(6) Actions Taken to Minimize Impacts. Sediment removal and placement of dental concrete will be limited to the smallest possible area. Appropriate controls shall be used during dredging to reduce sediment to be transported to areas outside of the localized construction area or to be discharged into the river downstream of Folsom Dam. Control measures would include the use of suction dredging or light clamshell dredging for the fine grain material. For the coarser material a traditional clamshell bucket with welded plates to reduce spillage would be used.

b. Water Circulation, Fluctuation and Salinity Determinations

(1) Water. The primary effect likely to result from sediment removal upstream of Folsom Dam is the resuspension of river sediment. Careful monitoring of dredging activities will prevent or significantly reduce the resuspension of sediment in the water column. The construction activities would not change the physical characteristics of the water in Folsom Dam.

(2) Current Patterns and Circulation. Sediment removal would not change any current patterns or water circulation. During sediment removal, releases would continue to be made through the river outlets and power penstocks. Following construction of the enlarged outlets, releases would continue to be made from the lower and upper level outlets as well as the power plant.

(3) Normal Water Level Fluctuations. None of the work would affect normal water level fluctuations.

(4) Salinity Gradients. Not applicable, the American River is a fresh water system.

(5) Actions That Will Be Taken to Minimize Impacts. Sediment removal and placement of dental concrete will be limited to the smallest possible area. Appropriate controls shall be used during dredging to reduce sediment to be transported to areas outside of the localized construction area or to be discharged into the river downstream of Folsom Dam. Control measures would include the use of suction dredging or light clamshell dredging for the fine grain material. For the coarser material a traditional clamshell bucket with welded plates to reduce spillage would be used.

c. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. Dredging activities will temporarily increase the suspended particulates and turbidity levels in the immediate vicinity of the construction activities. These effects will be short term and will be limited to the area immediate upstream of Folsom Dam.

(2) Effects (degree and duration) on Chemical and Physical Properties of the Water Column - light penetration, dissolved oxygen, toxic metals and organics, pathogens, aesthetics, others as appropriate. The increase in suspended particulates immediately upstream of the dam would decrease light penetration. However, this effect would be temporary and short-term.

(3) Effects on Biota. Dredging activities would increase suspended particulates immediately upstream of Folsom Dam. These activities may temporarily affect any filter or sight feeders in the immediate vicinity.

(4) Actions Taken to Minimize Impacts. Sediment removal and placement of dental concrete will be limited to the smallest possible area. Appropriate controls shall be used during dredging to reduce sediment to be transported to areas outside of the localized construction area or to be discharged into the river downstream of Folsom Dam. Control measures would include the use of suction dredging or light clamshell dredging for the fine grain material. For the coarser material a traditional clamshell bucket with welded plates to reduce spillage would be used.

d. Contaminant Determinations. Surface sediment sampling revealed elevated levels of nickel, chromium, and copper concentrations compared to the toxicity thresholds for aquatic organisms. Resuspended sediment will expose organisms to resuspended particles and dissolved constituents in the water column. Preliminary evaluation indicates that trace metal concentrations in the water column would not exceed aquatic toxicity thresholds. Best management practices for dredging will minimize any potential effects. Placement of dental concrete to fill over excavated areas adjacent to the dam will not introduce any contaminants into the water column.

e. Aquatic Ecosystem and Organism Determination

(1-4) Effects on plankton, benthos, nekton, and the aquatic food web. The benthic community would be temporarily disturbed by the removal of sediment upstream of Folsom Dam. Following sediment removal and placement of dental concrete the benthic community would reestablish.

(5) Effects on Special Aquatic Sites. The proposed action would not affect any special aquatic sites (sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs, or riffle and pool complexes). There are no special aquatic sites at the sediment removal site.

(6) Threatened and Endangered Species. No Federally or State listed threatened or endangered species would be affected by the sediment removal or the concrete placement. Although there is potential habitat for the valley elderberry longhorn beetle (elderberry shrubs) located around the perimeter of Folsom Dam, no beetles would be affected by the sediment removal or concrete fill. No dredging activities would occur within 100 feet from any elderberry shrubs.

(7) Other Wildlife. No wildlife habitat would be affected by the proposed sediment removal or concrete fill activities. Sediment removal would be conducted in open water and the dredged material would be placed in a permitted disposal site.

(8) Actions to Minimize Impacts. Sediment removal and placement of dental concrete will be limited to the smallest possible area. Appropriate controls shall be used during dredging to reduce sediment to be transported to areas outside of the localized construction area or to be discharged into the river downstream of Folsom Dam. Control measures would include the use of suction dredging or light clamshell dredging for the fine grain material. For the coarser material a traditional clamshell bucket with welded plates to reduce spillage would be used.

f. Proposed Disposal Site Determinations

(1) Mixing Zone Determination. The proposed work would be done in an area that is isolated from river currents.

(2) Determination of Compliance with Applicable Water Quality Standards. Water-quality management by the Central Valley Regional Water Quality Control Board includes establishment of beneficial uses and water-quality objectives. Protection and enhancement goals for identified beneficial uses determine the overall water-quality objectives. The primary beneficial uses of Folsom Reservoir include municipal and industrial supply, irrigation, power, water contact and non-contact recreation, warm and cold freshwater habitat, warm freshwater spawning habitat, and wildlife habitat. The standards for these uses will not be violated since best management practices would be employed to limit turbidity and sediment transport.

(3) Potential Effects on Human Use Characteristics

a. Municipal and Private Water Supply. The proposed work is located in the vicinity of the intake structure for the San Juan Water District. Use of a suction dredge or a light clamshell dredge will limit the amount of sediment that is resuspended in the water column. Downstream turbidity monitoring would be employed as a check on turbidity. In addition, coordination with the San Juan Water District and the cities of Folsom and Roseville would be ongoing during the dredging activities to ensure minimal effects to their water supply. Placing the dental concrete in the over excavated material would not affect the water intake structure.

b. Recreational and Commercial Fisheries. Potential effects to recreational fisheries at Folsom Lake would be less-than-significant. Work would be limited to the area immediately upstream of Folsom Dam and would not affect any spawning or rearing areas. Best management practices such as using a turbidity curtain would be employed to prevent movement of suspended materials. Since the dredging activities will take place in the winter, flood releases may be made through the outlets. Flood releases typically contain a higher amount of sediment than releases made during non-flood season. In the event that flood releases are necessary, dredging activities would cease. Releases may contain a higher sediment load than typical flood releases, but this material is expected to settle out in Lake Natoma. Fisheries in the lower American River would not be affected by the dredging activities.

c. Water Related Recreation. The proposed action would have a less-than-significant impact to water related recreation. The dredging and placement of dental concrete would be confined to the area immediately upstream of the dam and the work would not reduce the water quality required for water related recreation.

d. Aesthetics. The aesthetics of the local area would not be affected. Work would be confined to the area immediately upstream of the dam. The viewshed of the proposed action would not be altered. Dredged material would either be left on site and worked into the landscape, or hauled off site to a nearby landfill.

e. Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. The proposed action would have a less-than-significant effect on Folsom Lake State Recreation area. Recreational resources would continue to be available to the public while the proposed activities are occurring. There would be no change in the recreational opportunities available to the public as a result of the proposed work.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. The proposed activities would result less-than-significant adverse effects on the aquatic ecosystem. The proposed action would not result in any change to the operation of private reservoirs upstream of the project.

h. Determination of Secondary Effects on the Aquatic Ecosystem. The proposed activities would not result in secondary impacts to the aquatic ecosystem in the region.

III. FINDINGS OF COMPLIANCE

a. *Adaptation of the Section 404(b)(1) Guidelines to this Evaluation*. No special adaptation of the Section 404(b)(1) Guidelines have been made relative to this evaluation.

b. *Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem*. Three alternative methods of providing flood protection for the City of Sacramento were evaluated in the 1996 SEIS/EIR and Supplemental Information Report. As a result of that evaluation the modification of Folsom Dam and Reservoir was authorized for construction in the Water Resources Development Act of

1999.

c. *Compliance with Applicable State Water Quality Standards*. The proposed action complies with applicable State Water Quality Standards.

d. *Compliance with Endangered Species Act of 1973*. The proposed action is in compliance with the Endangered Species Act. No Federally listed species would be affected by the proposed action.

e. *Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972*. Not Applicable. There are no Marine Sanctuaries in the project area.

f. *Evaluation of Extent of Degradation of the Waters of the United States*. The proposed activities would not result in adverse effects on human health and welfare, water supplies, recreational values, fish, vegetation, or wildlife.

g. *Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the discharge on the Aquatic Ecosystem*. Suction or environmentally friendly clamshell dredging would be used to excavate the sediment. Downstream turbidity monitoring would be conducted as a check on the dredging activities. In addition, coordination with the Bureau of Reclamation, San Juan Water District, and Folsom State Recreation Area would be ongoing.

h. *Compliance with the Guidelines.* On the basis of the Guidelines, the proposed activities are specified as complying with the requirements of these guidelines, with the inclusion of the appropriate best management practices to minimize adverse effects on the aquatic ecosystem.