DEPARTMENT OF THE ARMY
CHIEF OF ENGINEERS
2600 ARMY PENTAGON
WASHINGTON, DC 20310-2600

DAEN

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SUBJECT: Sutter Basin, California

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on flood risk management for the Sutter Basin, California. It is accompanied by the report of the district and the division engineers. This report was undertaken in partial response to the authority contained in Section 209 of the Flood Control Act of 1962, Public Law 87-874, 76 Stat. 1180, 1196, for the study of flood risk management and related water resources problems in the Sacramento River Basin, including the study area in Sutter and Butte Counties, California. The non-federal sponsors for this project are the state of California Department of Water Resources and the Sutter Butte Flood Control Agency. Pre-construction engineering and design activities for the Sutter Basin, California Flood Risk Management Project will continue under the authority cited above.

2. The reporting officers recommend authorizing a plan to reduce flood risk by strengthening approximately 41 miles of the existing Feather River West Levee from the Thermalito Afterbay to Laurel Avenue. The recommended plan would reduce adverse flooding effects, including risks to public and life safety, in the northern portion of the basin as well as in Yuba City. The primary method of strengthening the existing levee is the construction of soil-bentonite cutoff walls of various depths. Non-structural measures would be implemented in conjunction with the recommended plan. These measures include preparation of an emergency evacuation plan, identification of flood fight pre-staging areas, updates to the floodplain management plan, and flood risk awareness communication.

3. The recommended plan would reduce flood risk within the Sutter Basin. The proposed project would reduce Expected Annual Damages (EAD) within the Sutter Basin by 64 percent, with a residual EAD of approximately $50,000,000. This residual EAD is primarily a result of existing flooding from the lower end of the Feather River and the Sutter Bypass within the southern portion of the basin, which is largely agricultural land and rural homes. Residual flooding also exists for the entire basin in the form of Feather River levee overtopping from events less frequent than the 0.5 percent (1/200) Annual Chance Exceedance (ACE) event. Annual Exceedance Probabilities (AEP) for flooding within Sutter Basin's existing urban communities would be reduced from approximately 4 percent-8 percent (depending on location) to approximately 0.2 percent.

4. All consultations with the U.S. Fish and Wildlife Service and the U.S. National Marine Fisheries Service necessary for construction of the project have been completed, in order to mitigate for the detrimental effects of the flood risk management features of the recommended plan on fish and wildlife habitat. Environmental effects resulting from the construction of the recommended plan would cause some direct effects on riparian habitat and special status species habitats that cannot be avoided. The mitigation recommendations of the U.S. Fish and Wildlife Service (FWS) contained in the Final Fish and Wildlife Coordination Act Report are concurred in and are included in the recommended plan. The recommended plan includes a Fish and Wildlife Mitigation and Monitoring plan to compensate for adverse effects on fish and wildlife resources and to ensure the success of mitigation features. Other mitigation measures have been adopted to minimize the impact of construction on water quality, noise and vibration, and air quality. Endangered Species Act consultation with the FWS, in coordination with the non-federal sponsors, remains to be completed concerning the operations and maintenance of the project after construction, which is the responsibility of the non-federal sponsors under federal law. Cultural resource effects have been identified and coordinated with consideration of historical sites and structures in the Yuba City area and some prehistoric sites near the existing levee areas. The recommended plan would be in full compliance with the vegetation guidelines of Engineering Technical Letter 1110-2-571, Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams and Appurtenant Structures (Vegetation ETL) and maximum potential effects have been disclosed. During the preconstruction engineering and design (PED) phase, all options then available for compliance with the Vegetation ETL will be considered and consultation with resource agencies will be completed in coordination with the non-federal sponsors.

5. The first cost was estimated on the basis of October 2013 price levels and amounts to $688,930,000. Estimated average annual costs of $33,000,000 were based on a 3.50 percent discount rate, a period of analysis of 50 years, and construction ending in 2023. The cost of lands, easements, rights-of-way , relocations, and dredged or excavated material disposal areas (LERRD) is estimated at $141,005,000. The Sutter Butte Flood Control Agency would be responsible for the operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the project after construction, a cost currently estimated at about $454,000 per year, an increase of $22,000 over existing costs from existing OMRR&R commitments of the existing levee.

6. The recommended plan encompasses two separable elements: the National Economic Development (NED) Plan, which will be cost shared with the non-federal sponsors, and a Locally Preferred Plan (LPP) increment, which will be funded 100 percent by the non-federal sponsors. The cost of the NED Plan is estimated to be $391,840,000, with an estimated federal cost of $255,270,000 and an estimated non-federal cost of $136,570,000. The cost of the separable element constituting the LPP increment is estimated to be $297,090,000. Since the non-federal sponsors would be responsible for the extra cost of the LPP increment, the non-federal cost share will increase from an estimated $136,570,000 for the non-federal share of the

NED Plan to an estimated total non-federal cost of $433,660,000 for the entire recommended plan. The LPP increment reduces the vulnerability of a larger population that is economically disadvantaged including an elderly population with limited mobility that are subject to sudden and unpredictable failures with minimal warning time. The plan increment provides more evacuation routes relative to the NED Plan and improves the reliability of critical infrastructure exposed to the same flood risk while reducing substantial economic flood damages.

7. Local interests have completed construction of the Star Bend setback levee to replace a section of the right bank of the Feather River levee to address critical underseepage and flow constriction issues. Prior to initiation of construction, local interests requested and by letter dated June 10, 2009, the ASA(CW) approved Section 104 credit consideration for the levee construction. Construction of the setback levee was completed in 2010 at an estimated cost of $20,776,349. The locally constructed setback levee is compatible to the recommended plan as an acceptable substitute. The Section 104 approval will allow design and construction dollars invested by the local sponsor to be considered for use as credit towards meeting the non-federal cost-share requirements for the project recommended by this feasibility study, if authorized.

8. Based on a 3.50 percent discount rate and a 50-year period of analysis, the total equivalent average annual costs of the project are estimated to be $33,000,000, including OMRR&R and interest during construction. The selected plan is estimated to be 97 percent reliable in providing flood risk management from a flood which has a one percent chance of occurrence in any year (100-year flood) for the communities of Biggs, Gridley, Live Oak, Yuba City and rural Butte County while only 22 percent reliable in reducing those risks for rural Sutter County south of Yuba City. The recommended plan would reduce average annual flood damages by approximately 64 percent and would leave average annual residual damages estimated at $50,000,000. The population at risk within the 1 percent ACE floodplain for the No Action Alternative is 94,600. The recommended plan would reduce the population at risk to approximately 6,600. Average annual economic benefits are estimated to be $87,000,000; net average annual economic benefits are $54,000,000. The benefit-to-cost ratio is 2.6 to 1.

9. The recommended plan is similar to an alternative considered in the Final Environmental Impact Statement (FEIS), filed by U.S. Army Corps of Engineers (USACE) with the Environmental Protection Agency (EPA) on June 7, 2013, and Record of Decisions (dated July 19, 2013 and September 13, 2013) for Section 408 approval for the alteration of federal project levees under the Feather River West Levee Project (FRWLP). The Sutter Basin Flood Risk Management Project (SBFRMP) and FRWLP affect the same general area, have similar flood risk management objectives, and share potential measures and effects. As a consequence, National Environmental Policy Act compliance for the SBFRMP was accomplished by supplementation of the Section 408 FRWLP FEIS to address the environmental effects of the

features of the SBFRMP that differ from the FRWLP. The Final Feasibility Report, Final Environmental Impact Statement, and Supplemental Environmental Impact Statement focuses on the additional effects that would result from the SBFRMP, incorporating by reference, where appropriate, information, analyses, and conclusions contained in the FRWLP FEIS.

10. The goals and objectives included in the Campaign Plan of the USACE have been fully integrated into the Sutter Basin Pilot Feasibility study process. The recommended plan has been designed to avoid or minimize environmental impacts while maximizing future safety and economic benefits to the community. The recommended plan uses environmentally sustainable design of fix-in-place levee construction that was in coordination with a local community coalition to integrate project objectives and public concerns.

11. In accordance with the Engineering Circular on review of decision documents, all technical, engineering and scientific work underwent an open, dynamic and vigorous review process to ensure technical quality. This included an Agency Technical Review (ATR), an Independent External Peer Review (IEPR) (Type I), and USACE Headquarters policy and legal review. All concerns of the ATR have been addressed and incorporated into the final report. The IEPR was completed by Battelle Memorial Institute with all comments documented. The panel had 19 comments, one of which they considered significant, 15 were medium significance and 3 were low significance. The comments pertained to hydrology and hydraulic engineering, geotechnical engineering, civil engineering, economics and environmental concerns. In summary, the panel felt that the engineering, economics and environmental analysis were adequate and the additional sensitivity analysis and clarifications needed to be properly documented in the final report. The IEPR review comments resulted in no significant changes to the plan formulation, engineering assumptions, and environmental analyses that supported the decision-making process and plan selection. The final report/environmental impact statement also underwent state and agency review. The state and agency comments received during review of the final report/programmatic environmental impact statement provided no additional comments than those provided on the draft report that were incorporated into the final report. All comments from the above referenced reviews have been addressed and incorporated into the final documents as appropriate. Overall the reviews resulted in improvements to the technical quality of the report including the enhanced communication of risk and uncertainty. A safety assurance review (IEPR Type II) will be conducted during the design phase of the project.

12. Washington level review indicates that the project recommended by the reporting officers is technically sound, environmentally and socially acceptable, and economically justified. The plan complies with all essential elements of the U.S. Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Land related resources implementation studies and complies with other administrative and legislative policies and guidelines. Also, the views of interested parties, including federal, state and local agencies have been considered.

13. I concur in the findings, conclusions, and recommendations of the reporting officers. Accordingly, I recommend that the plan to reduce flood risk in the Sutter Basin area including Yuba City, California, be authorized in accordance with the reporting officers' recommended plan at an estimated cost of $688,930,000 with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing, financing, and other applicable requirements of federal and state laws and policies, including Section 103 of Water Resources Development Act of 1986, as amended (33 U.S.C. 2213). The non-federal sponsor would provide the non-federal cost share and all LERRDs. Further, the non-federal sponsor would be responsible for all OMRR&R. This recommendation is subject to the non-federal sponsors agreeing to comply with all applicable federal laws and policies, including but not limited to:

a. Provide the non-federal share of total project costs, including a minimum of 35 percent but not to exceed 50 percent of total costs of the NED Plan, as further specified below:

(1) Provide 35 percent of design costs in accordance with the terms of a design agreement entered into prior to commencement of design work for the project;

(2) Provide, during construction, a contribution of funds equal to 5 percent of total project costs;

(3) Provide all lands, easements, rights-of -way (LER), including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material; perform or ensure the performance of all relocations; and construct all improvements required on LER to enable the disposal of dredged or excavated material all as determined by the government to be required or to be necessary for the construction, operation, and maintenance of the project;

(4) Provide, during construction, any additional funds necessary to make its total contribution equal to at least 35 percent of total costs of the NED Plan;

(5) Provide 100 percent of all costs of the LPP increment.

b. Shall not use funds from other federal programs, including any non-federal contribution required as a matching share, therefore, to meet any of the non-federal obligations for the project unless the federal agency providing the federal portion of such funds verifies in writing that expenditure of such funds for such purpose is authorized.

c. Not less than once each year, inform affected interests of the extent of protection afforded by the project.

d. Agree to participate in and comply with applicable federal flood plain management and flood insurance programs.

e. Comply with Section 402 of the WRDA of 1986, as amended (33 U.S.C. 701b-12), which requires a non-federal interest to prepare a flood plain management plan within one year after the date of signing a project cooperation agreement, and to implement such plan not later than one year after completion of construction of the project.

f. Publicize flood plain information in the area concerned and provide this information to zoning and other regulatory agencies for their use in adopting regulations, or taking other actions, to prevent unwise future development and to ensure compatibility with protection levels provided by the project.

g. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) such as any new developments on project LER or the addition of facilities which might reduce the level of protection the project affords, hinder operation and maintenance of the project, or interfere with the project's proper function.

h. Comply with all applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 Code of Federal Regulations (CFR) Part 24, in acquiring LER required for construction, operation, and maintenance of the project, including those necessary for relocations, the borrowing of materials, or the disposal of dredged or excavated material; and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

i. For so long as the project remains authorized, operate, maintain, repair, rehabilitate, and replace the project, or functional portions of the project, including any mitigation features, at no cost to the federal government, in a manner compatible with the project's authorized purposes and in accordance with applicable federal and state laws and regulations and any specific directions prescribed by the federal government.

j. Give the federal government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-federal sponsor owns or controls for access to the project for the purpose of completing, inspecting, operating, maintaining, repairing, rehabilitating, or replacing the project.

k. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, rehabilitation, and replacement of the project and any betterments, except for damages due to the fault or negligence of the United States or its contractors.

l. Keep and maintain books, records, documents, or other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, or other evidence are required, to the extent and in such detail as will properly reflect total project costs, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 CFR Section 33.20.

m. Comply with all applicable federal and state laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; 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 all applicable federal labor standards requirements including, but not limited to, 40 U.S.C. 3141 - 3148 and 40 U.S.C. 3701 - 3708 (revising, codifying and enacting without substantial change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq.*), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq.*), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c *et seq.*).

n. Perform, or ensure performance of, 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), Public Law 96-510, as amended (42 U.S.C. 9601-9675), that may exist in, on, or under lands, easements, or rights-of-way that the federal government determines to be required for construction, operation, and maintenance of the project. However, for lands that the federal government determines to be subject to the navigation servitude, only the federal government shall perform such investigations unless the federal government provides the non-federal sponsor with prior specific written direction, in which case the non-federal sponsor shall perform such investigations in accordance with such written direction.

o. Assume, as between the federal government and the non-federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under LER that the federal government determines to be required for construction, operation, and maintenance of the project.

p. Agree, as between the federal government and the non-federal sponsor, that the non-federal sponsor shall be considered the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, repair, rehabilitate, and replace the project in a manner that will not cause liability to arise under CERCLA.

q. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended (42 U.S.C. 1962d-5b), and Section 103(j) of the WRDA of 1986, Public Law 99-662, as amended (33 U.S.C. 2213(j)), which provides that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof, until each non-federal interest has entered into a written agreement to furnish its required cooperation for the project or separable element.

14. 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 or the perspective of higher review levels within the executive branch. Consequently, the recommendation may be modified before it is transmitted to the Congress as a

proposal for authorization and implementation funding. However, prior to transmittal to Congress, the sponsor, the state, interested federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.

THOMAS P. BOSTICK
Lieutenant General, USA
Chief of Engineers