REVIEW PLAN

SUTTER BASIN, CALIFORNIA
FLOOD RISK MANAGEMENT, ECOSYSTEM RESTORATION AND RECREATION FEASIBILITY STUDY

SACRAMENTO DISTRICT

US Army Corps of Engineers ®

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1. PURPOSE AND REQUIREMENTS

A. Purpose.

This document outlines the Review Plan for the Sutter basin, California, Flood Risk Management, Ecosystem Restoration and Recreation Feasibility Study. This feasibility study process is anticipated to culminate in a decision document to Congress for potential authorization of a new project. Engineering Circular (EC) *Civil Works Review Policy*, EC 1165-2-209, dated 31 January 2010, establishes the technical and overall quality control review processes for decision documents. That EC applies to all feasibility studies and reports and any other reports that lead to decision documents that require authorization by Congress. The Sutter basin Feasibility Report is anticipated to result in recommendations to Congress for authorization of a project and is therefore covered by this EC.

EC 1165-2-209 formally distinguishes between technical review performed in-district (District Quality Control/Quality Assurance, "DQC") and out-of-district resources (formerly Independent Technical Review, "ITR," now Agency Technical Review, "ATR"). It also defines the requirement for the two types of Independent External Peer Review (IEPR); this is the most independent level of review and is applied in cases that meet certain criteria where the risk and magnitude of a proposed project are such that a critical examination by a qualified team outside of the U.S. Army Corps of Engineers (USACE) is warranted.

B. Requirements.

EC 1165-2-209 outlines the requirement of the three review approaches (DQC, ATR, and IEPR) and provides guidance on Corps Planning Centers of Expertise (PCX) involvement in the approaches. This document addresses review of the decision document as it pertains to both approaches and planning coordination with the appropriate PCX. The Sutter basin, California, Feasibility Study will investigate flood risk management (FRM), ecosystem restoration (ER), and recreation issues in the study area. The non-Federal partners have expressed a strong desire that FRM be considered the primary focus of the feasibility study, while identifying opportunities for ecosystem restoration and recreation where they are consistent with FRM features. Therefore, the PCX for FRM is considered to be the primary PCX for coordination. The PCX for FRM will coordinate with the PCX for ER as appropriate.

(1) District Quality Control. DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Sutter basin, Feasibility Study Project Management Plan (PMP), dated April 2008, for the study (to which this Review Plan will ultimately be appended). It is managed in the District and may be conducted by in-house staff as long as the reviewers are not doing the work involved in the study, including contracted work that is being reviewed. Basic quality control tools include a Quality Management Plan (QMP) providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. The chief of the district element that is responsible for the hydrological analysis shall certify the hydrology prior to the first milestone

conference in the feasibility phase. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices and the recommendations before the approval by the District Commander. For the Sutter Basin Feasibility Study, the SPK Flood Risk Manager will conduct reviews in accordance with Executive Order 11988. In addition, non-PDT members and/or supervisory staff will conduct a review for major draft and final products, including products provided by the non-Federal sponsors as in-kind services following review of those products by the PDT. The Major Subordinate Command (MSC)/District are directly responsible for the QM and QC respectively, and to conduct and document this fundamental level of review. A Quality Control Plan (QCP) is included in the PMP for the subject study and addresses DQC by the MSC/District. Funding for DQC will be provided by cross charge labor codes and is estimated to cost approximately $25,000. DQC is required for this study and is not addressed further in this Review Plan.

(2) Agency Technical Review. EC 1165-2-209 recharacterized ATR (which replaces the level of review formerly known as Independent Technical Review) into an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of a project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR team reviews the various work products and assures that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), etc.) and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home MSC. EC 1165-2-209 requires that DrChecks https://www.projnet.org/projnet/) be used to document all ATR comments, responses, and associated resolution accomplished. This Review Plan outlines the proposed approach to meeting this requirement for the Sutter Basin, California, Feasibility Study. ATR is required for this study.

(3) Independent External Peer Review. EC 1165-2-209 recharacterized the external peer review process that was originally added to the existing Corps review process via EC 1105-2-408. IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. IEPR is managed by an outside eligible organization (OEO) that is described in the Internal Review Code Section 501(c) (3), is exempted from Federal tax under Section 501(a), of the Internal Revenue Code of 1986; is independent; is free from conflicts of interest; does not carry out or advocate for or against Federal water resources projects; and has experience in establishing and administering IEPR panels. The OEO will recruit and select the IEPR panel members. The Corps will not nominate prospective panel members, nor will the public, including scientific or professional societies be asked to nominate potential IEPR panel members. The scope of review will address all the underlying planning, engineering, including safety assurance, economics, and environmental analyses performed, not just one aspect of the project. The IEPR will be on the technical aspects of the project while the ATR will be responsible for the agency and administration's policy review. IEPR is divided into two types; Type I IEPR is generally for decision documents, while Type II is generally for implementation documents.

Type I IEPR is conducted on project studies. It is of critical importance for those decision documents and supporting work products where there are public safety concerns, a high level of complexity, novel, or precedent-setting approaches; has significant interagency interest; has significant economic, environmental, and social effects to the nation; or where the Chief of Engineers determines that the project is controversial. However, it is not limited to only those cases and most studies should undergo Type I IEPR.

Type II IEPR, a Safety Assurance Review (SAR), shall be conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where existing and potential hazards pose a significant threat to human life. External panels will conduct reviews of the design and construction activities prior to the initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health, safety, and welfare.

This Review Plan outlines the planned approach to meeting the IEPR requirement for the Sutter Basin, California, Feasibility Study. Type I IEPR is required for this study. Since the decision document is the basis of ultimate design, safety assurance will be incorporated into the project as appropriate. If a project is recommended for authorization, it is anticipated that Type II IEPRs will be required during project implementation.

(4) Policy and Legal Compliance Review. In addition to the technical reviews, decision documents will be reviewed throughout the study process for their compliance with law and policy. These reviews culminate in Washington-level determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the Chief of Engineers. Guidance for policy and legal compliance reviews is addressed further in Appendix H, ER 1105-2-100. Technical review described in EC 1165-2-209 are to augment and complement the policy review processes by addressing compliance with published Army polices pertinent to planning products, particularly polices on analytical methods and the presentation of findings in decision documents. DQC and ATR efforts are to include the necessary expertise to address compliance with published planning policy. Counsel will generally not participate on ATR teams, but may at the discretion of the district or as directed by higher authority. When policy and/or legal concerns arise during DQC or ATR efforts that are not readily and mutually resolved by the PDT and the reviewers, the District will seek issue resolution support from the MSC and HQUSACE in accordance with the procedures outlined in Appendix H ER 1105-2-100. IEPR teams are not expected to be knowledgeable of Army and administration polices, nor are they expected to address such concerns. An IEPR team should be given the flexibility to bring important issues to the attention of decision makers. Legal reviews will be conducted concurrent with ATR of the preliminary, draft and final feasibility report and environmental impact statement.

(5) Planning Center of Expertise (PCX) Coordination. EC 1165-2-209 outlines PCX coordination in conjunction with preparation of the Review Plan. This Review Plan is being coordinated with the PCX for Flood Risk Management (FRM), who in turn will coordinate with the PCX for Ecosystem Restoration (ER) as appropriate. The PCX for FRM is responsible for the accomplishment and quality of ATR and IEPR for the Sutter basin, California, Feasibility Study. The DQC is the responsibility of the MSC/District. The PCX for FRM may conduct the review or manage the ATR and IEPR reviews to be conducted by others.

(6) Review Plan Approval and Posting. In order to ensure the Review Plan is in compliance with the principles of EC 1165-2-209 and the MSC's QMP, the Review Plan must be approved by the applicable MSC, in this case the Commander, South Pacific Division (SPD). Once the Review Plan is approved, the District will post it to its district public website and notify SPD and the PCX for FRM.

(7) Review Plan Public Comment. The district’s public internet website to which the

Review Plan will be posted shall include provisions for public comment on the adequacy of this Review Plan. Full consideration will be given to public comments on this plan and plan revisions made, and approved, as warranted.

(8) Safety Assurance Review (SAR). Section 2034 and 2035 of WRDA 2007, and EC 1165-2-209, require that all projects addressing flooding or storm damage reduction undergo a SAR during design and construction. This study will address safety assurance factors (significant threats to human life, project cost thresholds, etc.), which at a minimum will be included in the draft report and appendixes for public and agency review. Prior to preconstruction engineering and design (PED) of a project identified for construction, a PMP will be developed that will include SAR's with the selection of external panels to perform the independent external peer reviews during design and construction.

2. STUDY INFORMATION

A. Decision Document.

The purpose of the study is to identify flood risk, ecosystem restoration and recreation-related issues in the study area. The decision document, a General Investigation Feasibility Study report, is expected to be the basis for a recommendation to Congress for authorization of a new project. The report will present planning, engineering, and implementation details of the recommended plan to allow final design and construction to proceed subsequent to approval of the recommended plan. The project is a General Investigations study undertaken to evaluate structural and non-structural FRM measures including re-operation of existing reservoirs, improvements to existing levees, construction of new levees, and other storage, conveyance and non-structural options. ER measures would likely include restoration of floodplain function and habitat. Recreation measures include those outdoor recreation opportunities associated with sustainable water resource development. The feasibility phase of this project is cost shared 50 percent Federal, 50 percent non-Federal with the project sponsors, the State of California Central Valley Flood Protection Board (CVFPB) and the Sutter Butte Flood Control Agency (SBFCA).

B. General Site Description.

The study area is that area hydraulically connected to Yuba City, California and roughly bounded by the Feather River, Sutter Bypass, Wadsworth Canal, Sutter Buttes, and Cherokee Canal (see Figure 1). The elongated, irregularly shaped study area covers about 284 square miles and is about 43 miles long, north to south, and up to 9 miles wide east to west. Flood waters potentially threatening the study area originate from the Feather River watershed or the upper Sacramento River watershed, above Colusa Weir. These waterways have drainage areas of 5,921 and 12,090 square miles, respectively.

C. Study Scope.

The study will focus on alternatives within the study area that are comprised of FRM, ER and recreation management measures. The non-Federal sponsors are primarily interested in reducing flood risk to Yuba City and other communities in the study area, as well as protecting public infrastructure. They are also interested in pursuing opportunities to restore degraded ecosystems and improve outdoor recreation, either as adjuncts to flood risk management features or as stand alone features. This could include participation by other non-Federal partners.

D. Problems and Opportunities.

The study area is almost completely bounded by project levees and the high ground of the Sutter Buttes. Consequently, the primary flood-related problems in the study area are associated with potential levee failure. Opportunities for reducing flood risk could be associated with increasing levee integrity, building new levees, altering waterway flow regimes as affected by upstream

reservoirs, providing new bypasses, and non-structural measures to accommodate flood events and improve public safety.

Primary ecosystem problems are related to the construction of levees and drainage facilities that have separated waterways from historic floodplains, drained wetlands, and eliminated historic drainage courses for agricultural and urban development purposes. Other ecosystem problems resulted from depositing mine tailings along riparian corridors and the construction of reservoirs that have altered historic flow regimes, both of which have resulted in loss of floodplain processes and associated native habitats. Opportunities to restore degraded ecosystems are those which would re-connect former floodplains and wetlands with the waterways from which they have been separated, re-grading mine tailing areas, enhancing or protecting interior drainage corridors, and by operating reservoirs to provide more "natural" flow regimes.

E. Potential Methods.

Potential structural FRM measures include building new levees to protect urban areas, rehabilitating project levees in place, realigning levees to improve hydraulic and/or foundation conditions and reduce maintenance requirements, constructing a relief structure to reduce backwater flooding, dredging, modifying upstream reservoirs, and constructing/modifying weirs and bypasses. Non-structural floodplain management measures, such as relocating or raising structures, development restrictions, flood warning systems, and improved emergency preparedness, will also be considered. For ecosystem restoration, measures range from restoring riparian, wetland, and floodplain habitats through conservation easements to re-aligning levees to restore hydraulic connectivity between former riparian areas and adjacent waterways, and possibly re-operating existing reservoirs to provide beneficial flows.

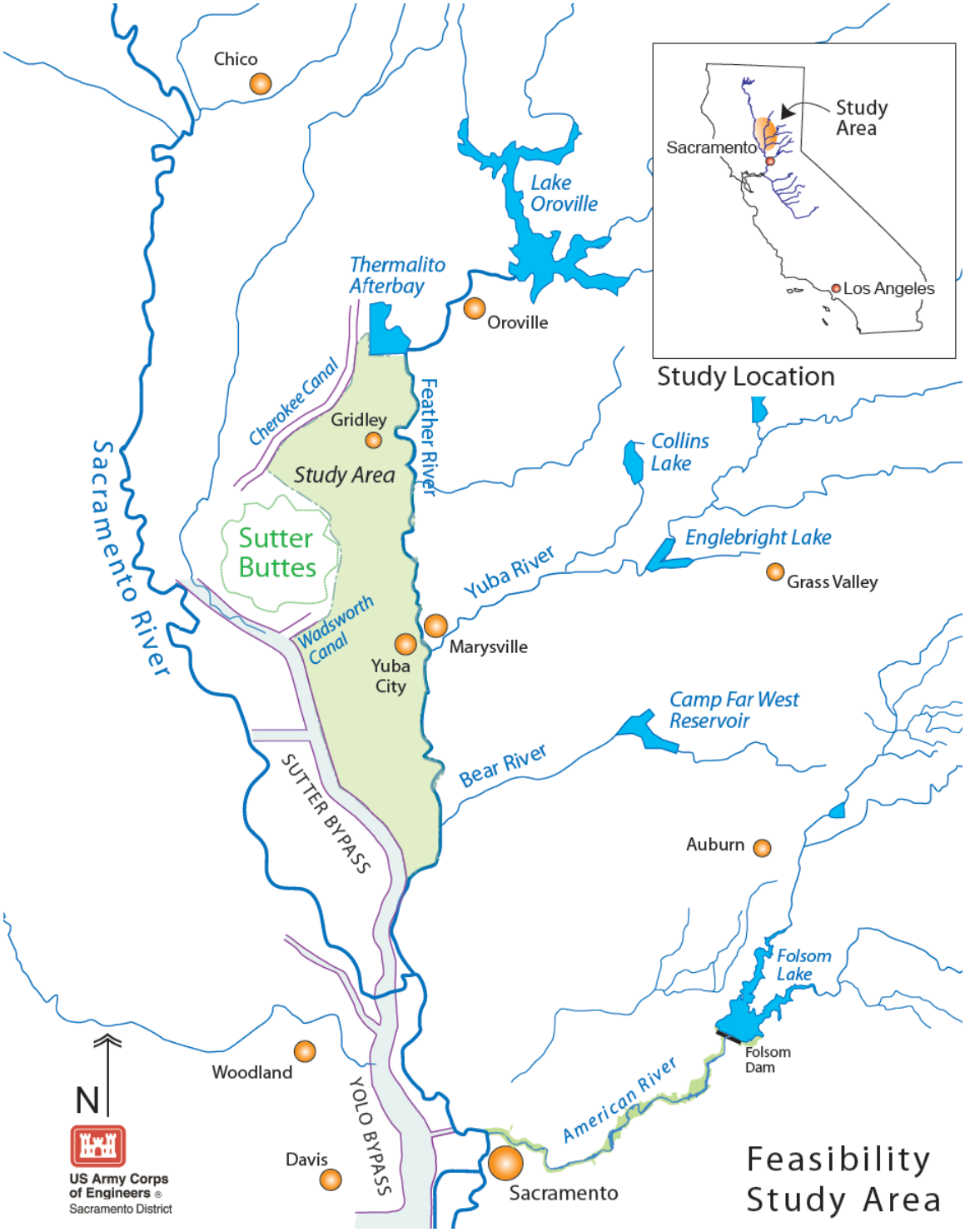

Figure 1. Sutter Basin Feasibility Study Area Vicinity and Location

3. AGENCY TECHNICAL REVIEW PLAN

For feasibility studies, ATR is managed by the PCX. For this feasibility study, due to the heavy emphasis on flood risk management, the PCX for FRM will identify individuals to perform ATR. District can provide suggestions on possible reviewers.

A. General.

An ATR Leader shall be designated by the PCX for the ATR process. The proposed ATR Leader for this project is to be selected from outside the South Pacific Division region and will have expertise in project planning. The ATR Leader is responsible for providing information necessary for setting up the review, communicating with the PDT, providing a summary of critical review comments, collecting grammatical and editorial comments from the ATR team (ATRT), ensuring that the ATRT has adequate funding to perform the review, facilitating the resolution of the comments, and certifying that the ATR has been conducted and resolved in accordance with policy. ATR will be conducted for project planning, environmental compliance, ecosystem restoration, economics, hydrology and reservoir operations, hydraulic design, civil design, geotechnical engineering, cost engineering, real estate, and cultural resources. Reviews of more specific disciplines maybe identified as appropriate.

B. Agency Technical Review Team (ATRT).

The ATRT will be comprised of individuals that have not been involved in the development of the decision document and will be chosen based on expertise, experience, and/or skills. The members will roughly mirror the composition of the PDT and will reside outside the District. It is anticipated that the team will consist of about 12 reviewers. The ATRT members will be identified at the time the review is conducted and will be presented in appendix B. Also included in Appendix are descriptions of the disciplines that comprise the ATRT.

C. Communication.

The communication plan for the ATR is as follows:

(1) The team will use DrChecks to document the ATR process based on the instructions provided in the most recent revision of *Writing a Review Comment* (USACE, Sacramento District, Engineering Division). The lead planner or project manager will facilitate the creation of a project portfolio in the system to allow access by all PDT and ATRT members. An electronic version of the document, appendices, and any significant and relevant public comments shall be posted in MS Office compatible format at: ftp://ftp.usace.army.mil/pub/ at least one business day prior to the start of the comment period.

(2) The ATR Leader and team members shall access the “ftp” site and download individual documents as appropriate for their respective reviews.

(3) The PDT shall host an ATR kick-off meeting to orient the ATRT during the first week of the comment period. If funds are not available for an on-site meeting, the PDT shall provide a presentation about the project, including photos of the site, for the team.

(4) The lead planner shall inform the ATR manager when all responses have been entered into DrChecks and conduct a briefing to summarize comment responses to highlight any areas of disagreement.

(5) A revised electronic version of the report and appendices with comments incorporated shall be posted at ftp://ftp.usace.army.mil/pub/ for use during back checking of the

comments.

(6) PDT members shall contact ATRT members or leader as appropriate to seek clarification of a comment's intent or provide clarification of information in the report. Discussions shall occur outside of DrChecks but a summary of discussions may be provided in the system.

(7) ATRT members will be encouraged to contact PDT members directly via email or phone to clarify any confusion. DrChecks shall not be used to post questions needed for clarification.

(8) The ATRT, the PDT, and the vertical team shall conduct an after action review (AAR) no later than 2 weeks after the policy guidance memo is received from HQUSACE for the for the AFB and draft reports.

D. Funding

(1) The PDT district shall provide labor funding by cross charge labor codes. Funding for travel, if needed, will be provided through government order. The project manager will work with the ATR manager to ensure that adequate funding is available and is commensurate with the level of review needed. The cost for this review is estimated to be in the range of $100,000 to $150,000. Any funding shortages will be negotiated on a case by case basis and in advance of a negative charge occurring.

(2) The ATR team leader shall provide organization codes for each ATR team members and a responsible financial point of contact (CEFMS responsible employee) for creation of labor codes.

(3) ATR team members shall monitor individual labor code balances and alert the ATRT Leader to any possible funding shortages.

E. Timing and Schedule

(1) Throughout the development of this document, the team will conduct seamless review to ensure planning quality.

(2) In February 2010, the ATR team participated in the required Technical Review Strategy Session (TRSS) along with the PDT (including non-Federal sponsors), functional chiefs, and MSC representatives. Items discussed during the TRSS included review of the PMP Quality Control Plan, the level of proposed reviews, the costs and schedules for proposed reviews, the documents and timing for reviews, and policy or technical issues for CESPD resolution.

(3) The ATR team in conjunction with a Value Engineering (VE) officer will conduct a VE study prior to the F4 conference. The VE study is expected to last about four days. The results of the VE study will be presented in the Feasibility Report and integrated into the discussion of alternative formulation.

(4) The ATR team will review the following documents:

- Alternative Review Conference (ARC) Pre-Conference Document (Planning Milestone F4) and Alternative Formulation Briefing (AFB) Pre-Briefing Document (Planning Milestone F4A) – this will be a single review with the F4A document serving as a backcheck for the F4 document.

- Draft Feasibility Report/Environmental Impact Statement/Environmental Impact Report (Planning Milestone F5)
- Final Feasibility Report/Environmental Impact Statement/Environmental Impact Report (Planning Milestone F6)

(5) The PDT will hold a "page-turn" session to review the draft report to ensure consistency across the disciplines and resolve any issues prior to the start of ATR.

(6) The ATR and IEPR process will follow the timeline presented in **Table 1**. IEPR is discussed in more detail in Section 4 of this document. Actual dates will be scheduled once the period draws closer. All products produced for these milestones will be reviewed, including those produced as in-kind services by the non-Federal sponsors.

Table 1. ATR and IEPR Timeline

Task	Date
ATR for In-Progress Review documentation	August 2010
ATR backcheck of In-Progress Review documentation revisions	September 2010
ATR certification of In-Progress Review documentation	September 2010
In-Progress Review Meeting	October 2010
ATR for Alternative Review Conference (F4) documentation	May 2011
Alternative Review Conference (F4)	July 2011
Alternative Formulation Briefing (F4A) – ATR backcheck of F4 documentation revisions	January 2012
ATR certification of F4 documentation	February 2012
ATR for Draft Feasibility Report (F5)	May 2012
ATR backcheck of Draft Feasibility Report revisions	June 2012
ATR certification of Draft Feasibility Report	June 2012
Final Meeting (F6) & Public Review of Draft Feasibility Report	July 2012
IEPR of Draft Feasibility Report	July 2012
Feasibility Review Conference (F7)	August 2012
ATR for Final Report	October 2012
ATR backcheck of Final Report revisions	November 2012
ATR certification of Final Report	November 2012
Submittal of Final Report to SPD (F8)	November 2012

F. Review

(1) ATRT responsibilities are as follows:

(a) Reviewers shall review conference materials and the draft report, as well as interim products as appropriate, to confirm that work was done in accordance with established professional principles, practices, codes, and criteria and for compliance with laws and policy. Comments on the report shall be submitted into DrChecks.

(b) Reviewers shall pay particular attention to one's discipline but may also comment on other aspects as appropriate. Reviewers that do not have any significant

comments pertaining to their assigned discipline shall provide a comment stating this.

(c) Grammatical and editorial comments shall not be submitted into DrChecks. Comments should be submitted to the ATR Leader via electronic mail using tracked changes feature in the MS Office compatible document or as a hard copy mark-up. The ATR Leader shall provide these comments to the lead planner.

(d) Review comments shall contain these principal elements:

1 a clear statement of the concern
2 the basis for the concern, such as law, policy, or guidance
3 significance for the concern
4 specific actions needed to resolve the comment

(e) The "Critical" comment flag in DrChecks shall not be used unless the comment is discussed with the ATR Leader and/or the lead planner first.

(2) PDT Team responsibilities are as follows:

(a) The team shall review comments provided by the ATRT in DrChecks and provide responses to each comment using "*Concur*", "*Non-Concur*", or "*For Information Only*". *Concur* responses shall state what action was taken and provide revised text from the report if applicable. *Non-Concur* responses shall state the basis for the disagreement or clarification of the concern and suggest actions to negotiate the closure of the comment.

(b) PDT members shall discuss any "non-Concur" responses prior to submission with the PDT and ATRT Leader.

G. Resolution

(1) Reviewers shall back check PDT responses to the review comments and either close the comment or attempt to resolve any disagreements. Conference calls shall be used to resolve any conflicting comments and responses.

(2) A reviewer may close a comment if the comment is addressed and resolved by the response, or if the reviewer determines that the comment was not a valid technical comment as a result of a rebuttal, clarification, or additional information, or because the comment was advisory, primarily based on individual judgment or opinion, or editorial. If reviewer and responder cannot resolve a comment, it should be brought to the attention of the ATR Leader and, if not resolved by the ATR Leader, it should be brought to the attention of the planning chief who will need to sign the certification. ATRT members shall keep the ATR Leader informed of problematic comments. The vertical team will be informed of any policy variations or other issues that may cause concern during HQ review.

H. Certification

ATR certification is required for the AFB, draft report, and final report. See Appendix A for ATR certification statement.. A summary report of all comments and responses will follow this statement and accompany the report throughout the report approval process.

4. TYPE I INDEPENDENT EXTERNAL PEER REVIEW PLAN

Type I IEPR is conducted for decision documents if there is a vertical team decision (involving the district, MSC, PCX, and HQUSACE members) that the covered subject matter meets certain

criteria (described in EC 1165-2-209) where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside the USACE is warranted. Type I IEPR is coordinated by the appropriate PCX and managed by an OEO external to the USACE. Type I IEPR panels shall evaluate whether the interpretations of analysis and conclusions based on analysis are reasonable. To provide effective review, in terms of both usefulness of results and credibility, the review panels should be given the flexibility to bring important issues to the attention of decision makers; however, review panels should be instructed to not make a recommendation on whether a particular alternative should be implemented, as the Chief of Engineers is ultimately responsible for the final decision on a planning or reoperations study. Type I IEPR panels will accomplish a concurrent review that covers the entire decision document and will address all the underlying engineering, economics, and environmental work, not just one aspect of the study. Whenever feasible and appropriate, the office producing the document shall make the draft decision document available to the public for comment at the same time it is submitted for review (or during the review process) and sponsor a public meeting where oral presentations on scientific issues can be made to the reviewers by interested members of the public. A Type I IEPR panel or OEO representative will participate in the CWRB. The decision to conduct Type I IEPR is made by comparing EC 1165-2-209 criterion to the study, as shown in **Table 2**. Based on these factors, Type I IEPR will be conducted.

Table 2. Decision on Type I IEPR

EC 1165-2-209 Criteria	Sutter Basin Feasibility Study
Is there significant threat to human life?	There are urbanized areas within the study area that have experienced fatalities in past flood events; thus there is a threat to human life/safety.
Is the total project cost more than $45 million?	It can be assumed that the ultimate cost associated with a recommended plan is likely to be in the high hundreds of millions of dollars range.
Has the Governor of California requested a Type I IEPR?	The Governor has not requested a Type I IEPR.
Has the head of a Federal or state agency charged with reviewing the project study requested a Type I IEPR?	No requests have been received for a Type I IEPR for this study.
Will there be significant public controversy as to size, nature, or effects of the project?	The project has potential for public controversy.
Will there be significant public controversy as to the economic or environmental cost or benefit of the project?	The project has potential for public controversy.
Will the study be based on information from novel methods, present complex challenges or interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices?	The study will be highly complex and challenging because of the extensive river and tributary system; the existing reservoir and levee system; and the high degree of urbanization.

Disciplines that are anticipated to undergo IEPR are listed in Appendix B with experience and

qualifications equal or above the ATR member requirements. Work undertaken as part of these technical disciplines is considered to be highly complex due to the size of the study area as well as the existing complex water storage and conveyance system in the study area. Specific factors for this determination are (1) the large population center; (2) the complex existing levee and water conveyance system; (3) through-levee seepage, under-levee seepage and subsidence issues associated with the existing levees; (4) and the complex hydraulic system and associated floodplain. Of these products that will undergo IEPR, all will be reviewed by the PDT and undergo DQC and ATR prior to submittal for IEPR. This includes products that are produced by the non-Federal sponsors as in-kind services.

A. Products for Review.
Interim products for hydrology, hydraulic and geotechnical design and economics will be provided before the draft report is released for public review. The full IEPR panel will receive the entire draft feasibility report, environmental impact statement and all technical appendixes concurrent with public and agency review. The final report to be submitted by the IEPR panel must be submitted to the PDT within 60 days of the conclusion of public review. A representative of the IEPR panel must attend any public meeting(s) held during public and agency review of the draft report. The Sacramento District will draft a response to the IEPR final report and process it through the vertical team for discussion at the Civil Works Review Board (CWRB). An IEPR panel member must attend the CWRB. Following the CWRB, the Corps will issue final response to the IEPR panel and notify the public.

B. Communication and Resolution.
The communication plan for the IEPR is as follows:

(1) The panel will use DrChecks to document the IEPR process. The Study Manager will facilitate the creation of a project portfolio in the system to allow access by all PDT and the OEO. An electronic version of the document, appendices, and any significant and relevant public comments shall be posted in MS Office compatible format at: ftp://ftp.usace.army.mil/pub/ at least one business day prior to the start of the comment period.

The OEO will compile the comments of the IEPR panelists, enter them into DrChecks, and forwards the comments to the District. The District will consult the PDT and outside sources as necessary to develop a proposed response to each panel comment. The District will enter the proposed response to DrChecks, and then return the proposed response to the panel. The panel will reply to the proposed response through the OEO, again using DrChecks. This final panel reply may or may not concur with the District's proposed response and the panels final response will indicate concurrence or briefly explain what issue is blocking concurrence. There will be no final closeout iteration. The District will consult the vertical team and outside resources to prepare an agency response to each comment. The initial panel comments, the District's proposed response, the panels reply to the District's proposed response, and the final agency response will all be tracked and archived in DrChecks for the administrative record. However, only the initial panel comments and the final agency responses will be posted.

(2) The Outside Eligible Organization and IEPR panel members shall utilize the "ftp" site to access the appropriate individual documents for review.

(3) The Study Manager shall inform the IEPR panel when all responses have been entered into DrChecks and conduct a briefing to summarize comment responses to highlight any areas of disagreement.

(4) A revised electronic version of the report and appendices with comments

incorporated shall be posted at ftp://ftp.usace.army.mil/pub/ for use during back checking of the comments.

(5) The PDT shall contact the OEO for the IEPR panel as appropriate to seek clarification of a comment's intent or provide clarification of information in the report. Discussions shall occur outside of DrChecks but a summary of discussions may be provided in the system.

(6) The IEPR panel shall produce a final Review Report to be provided to the PDT not later than 60 days after the close of the public and agency review of the draft report. This final report shall be scoped as part of the effort to engage the IEPR panel. After District review of the final report a teleconference will held between the IEPR panel and the PDT to clarify reviewer's comments and discuss issue resolution. The Sacramento District will draft a response report to the IEPR final report and process it through the vertical team for discussion at the CWRB. Following direction at the CWRB and upon satisfactorily resolving any relevant follow-on actions, the Corps will finalize its response to the IEPR Review Report and will post both the Review Report and the Corps final responses to the public website.

D. Funding

The PCX for FRM will identify someone independent from the PDT to scope the IEPR and develop an Independent Government Estimate. The Sacramento District will provide funding to the IEPR panel. The cost of the IEPR is expected to be in the range of $150,000 to $300,000.

5. MODEL CERTIFICATION

For the purposes of this Review Plan section, planning models are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision-making. It includes all models used for planning, regardless of their scope or source, as specified in the following sub-paragraphs. This section does not cover engineering models used in planning which are certified under a separate process.

The computational models to be employed in the Sutter basin, California, Feasibility Study have either been developed by or for the USACE. Model certification and approval for all identified planning models will be coordinated through the PCX as needed. Project schedules and resources will be adjusted to address this process for certification and PCX coordination. They are:

1. HEC-FDA (Current working version undergoing review for certification; expected to be certified within the first 1 year of the study): This model, developed by the Corps' Hydrological Engineering Center, will assist the PDT in applying risk analysis methods for flood damage reduction studies, including structural and non-structural measures, as required by, EM 1110-2-1419. This program:
    - Provides a repository for the hydraulic, economic, hydrologic, and geotechnical data required for the damage analysis
    - Provides the tools needed to understand the flooding problem and aids in the formulation of alternatives from an economic and engineering performance perspective
    - Calculates the Expected Annual Damages and the Equivalent Annual Damages
    - Computes the Annual Exceedence Probability, long-term risk, and the Conditional Non-Exceedence Probability

- Implements the risk-based analysis procedures contained in EM 1110-2-1619

2. Various Habitat Evaluation Procedure models. The Ecosystem Restoration Planning Center of Expertise has responsibility for approving ecosystem output methodologies for use in ecosystem restoration planning and mitigation planning. The Ecosystem PCX will need to certify or approve for use each regionally modified version of these methodologies and individual models and guidebooks used in application of these methods. The PDT will coordinate with the Ecosystem PCX during the study to identify appropriate models and certification approval requirements.
3. IWR-Planning Suite (Certified). This software assists with the formulation and comparison of alternative plans. While IWR-PLAN was initially developed to assist with environmental restoration and watershed planning studies, the program can be useful in planning studies addressing a wide variety of problems. IWR-PLAN can assist with plan formulation by combining solutions to planning problems and calculating the additive effects of each combination, or "plan." IWR-PLAN can assist with plan comparison by conducting cost effectiveness and incremental cost analyses, identifying the plans which are the best financial investments and displaying the effects of each on a range of decision variables.

The following are considered to be engineering models as opposed to planning models and undergo a different review and approval process for usage. Engineering tools anticipated to be used in this study are:

1. MCACES or MII: These are cost estimating models.
2. HEC-HMS: By applying this model the PDT is able to:
   - Define the watersheds' physical features
   - Describe the meteorological conditions
   - Estimate parameters
   - Analyze simulations
   - Obtain GIS connectivity
3. HEC-ResSim: This model predicts the behavior of reservoirs and to help reservoir operators plan releases in real-time during day-to-day and emergency operations. The following describes the major features of HEC-ResSim
   - Graphical User Interface
   - Map-Based Schematic
   - Rule-Based Operations
4. HEC-RAS: The function of this model is to complete one-dimensional hydraulic calculations for a full network of natural and man made channels. HEC-RAS major capabilities are:
   - User interface
   - Hydraulic Analysis
   - Data storage and Management
   - Graphics and reporting
5. HEC-1: This is a watershed program model that simulates the precipitation-runoff process. Precipitation runoff, channel routing. Reservoir routing, diversions, and hydrograph combinations are used to estimate hydrographs at various locations. Other capabilities include automatic parameter estimation and flood damage analysis. This model is limited to single event analysis and does not account for downstream backwater conditions.
6. HEC-5: This model simulates the sequential operation of a system of reservoirs for short interval historical or synthetic floods, long duration non-flood periods, or combinations

of the two. This can be used to evaluate reservoir systems to determine storage requirements, changes in runoff distribution, operational criteria, energy generation demands and capabilities, and compare alternatives.

7. UNET: This computer model, developed by Dr. Robert Barkau, is designed to simulate unsteady flow through a full network of open channels, weirs, bypasses, and storage areas.
8. FLO-2D: This model will be used for the overbank reaches.
9. Groundwater Modeling System (GMS): The SEEP2D model embedded within the GMS graphical user interface is used to conduct finite-element two-dimensional seepage analysis. This is primarily used to evaluate:
    a. Levee underseepage
    b. Levee through-seepage
10. Utexas4: This model is used in conjunction with GMS/SEEP2D to conduct slope stability analysis. This program searches for the lowest factor of safety for static stability for circular and non-circular failure surfaces using a limit-equilibrium method. This model is used primarily to evaluate:
    a. Long-term static stability of levees
    b. Stability of levees during construction loading
    c. Stability of levees during seismic loading
    d. Stability of levees during rapid-drawdown conditions

6. PUBLIC AND AGENCY REVIEW

The public and agencies will have opportunities to participate in this study. The earliest opportunity will be as part of the public scoping process during the first year of the study. Public review of the draft feasibility report will occur after issuance of the AFB policy guidance memo and concurrence by HQUSACE that the document is ready for public release. As such, public comments other than those provided at any public meetings held during the planning process will not be available to the review teams. Public review of the draft report will begin approximately 1 month after the completion of the ATR process and policy guidance memo. The period will last a minimum of 45 days as required for an Environmental Impact Statement. One or more public workshops will be held during the public and agency review period. The final public meeting on the draft report (Milestone F6) is scheduled for July 2012. Comments received during the public comment period for the draft report could be provided to the IEPR team prior to completion of the final Review Report and to the ATRT before review of the final Decision Document. The public review of necessary state or Federal permits will also take place during this period. A formal State and Agency review will occur concurrently with the public review. However, it is anticipated that intensive coordination with these agencies will have occurred concurrent with the planning process. Upon completion of the review period, comments will be consolidated in a matrix and addressed, if needed. A comment resolution meeting will take place if needed to decide upon the best resolution of comments. A summary of the comments and resolutions will be included in the document. A plan for public participation will be developed early in the study which might identify informal as well as additional formal forums for participation in the study.

7. STUDY TEAMS & PLANNING CENTERS OF EXPERTISE COORDINATION

A. Product Delivery Team.

The PDT is comprised of those individuals directly involved in the development of the decision document. Individual contact information and disciplines are presented in Appendix B. In accordance with the PMP, dated April 2008, it is planned that the non-Federal sponsors will contribute in-kind services for project management; public involvement, coordination and

outreach; environmental impact and planning studies; reservoir operations study, hydraulic analysis and report; engineering design analysis; Geotechnical studies & report; economic data collection; real estate activities; and participating in reviews. All in-kind work products will undergo review by the PDT for a determination of adequacy; products will ultimately undergo DQC. Some products will undergo IEPR (described later in this Review Plan).

B. Vertical Team.
The Vertical Team includes District management, District Support Team (DST) and Regional Integration Team (RIT) staff as well as members of the Planning of Community of Practice (PCoP). Specific points of contact for the Vertical Team can be found in Appendix B. This Review Plan will serve as the coordination document to obtain vertical team consensus. Subsequent to PCX approval, the plan will be provided to the vertical team for approval. MSC approval of the plan will indicate vertical team consensus.

C. Planning Center of Expertise (PCX)
The appropriate PCX for this document is the National Flood Risk Management Center of Expertise located at SPD. The PCX for FRM will coordinate with the National Ecosystem Restoration Planning Center of Expertise at MVD, as appropriate. If this study results in Congressional authorization, as expected, the FRM-PCX will also coordinate with the NWW Cost Estimating Center of Expertise. This Review Plan will be submitted to the PCX for FRM Director for review and comment. Since it was determined that this project is high risk, an IEPR will be required. As such, the PCX will be asked to manage the IEPR review. For ATR, the PCX is requested to nominate the ATR team as discussed in paragraph 3.b. above. The approved Review Plan will be posted to the District's public website.

D. Review Plan Points of Contact
The Points of Contact for questions and comments to this Review Plan are as follows:

1. District Point of Contact: Fraser Gensler, Planner, 916-557-6849 or r.fraser.gensler@usace.army.mil
2. MSC Point of Contact: TBD
3. FRM-PCX Point of Contact: Eric Thaut, Program Manager, 415-503-6852 or eric.w.thaut@usace.army.mil

8. APPROVALS

The PDT will carry out the Review Plan as described. The Study Manager will submit the plan to the PDT District Planning Chief for approval. Formal coordination with PCX for FRM will occur through the PDT District Planning Chief.

The Review Plan is a "living document" and shall be updated as needed during the study process. The FRM-PCX shall be provided an electronic copy of any revised approved Review Plan. The PDT shall follow their DST's guidance for processing revised Review Plans for their respective MSCs.

REVIEW PLAN

SUTTER BASIN, CALIFORNIA
FLOOD RISK MANAGEMENT, ECOSYSTEM RESTORATION AND RECREATION FEASIBILITY STUDY

SACRAMENTO DISTRICT

APPENDIX A
STATEMENT OF AGENCY TECHNICAL REVIEW

COMPLETION OF AGENCY TECHNICAL REVIEW
SUTTER BASIN, CALIFORNIA
FLOOD RISK MANAGEMENT, ECOSYSTEM RESTORATION AND RECREATION FEASIBILITY STUDY, ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT AND APPENDICES

The Sacramento District has completed the project implementation report (feasibility report), environmental impact statement/environmental impact report and appendices of the Sutter basin Feasibility Study. Notice is hereby given that an agency technical review, that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the Review Plan. During the agency technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level obtained; and reasonableness of the result, including whether the product meets the customer's needs consistent with law and existing Corps policy. The ATR was accomplished by an agency team composed of staff from multiple districts. All comments resulting from the ATR have been resolved.

TBD _____ _____

NAME Date
Team Leader, Sutter basin
Feasibility Study
Agency Technical Review Team

CERTIFICATION OF AGENCY TECHNICAL REVIEW

A summary of all comments and responses is attached. Significant concerns and the explanation of the resolution are as follows:

(*Describe the major technical concerns, possible impact and resolution*)

As noted above, all concerns resulting from the independent technical review of the project have been fully resolved.

_____ _____

NAME Date
Chief, Planning Division

REVIEW PLAN

SUTTER BASIN, CALIFORNIA
FLOOD RISK MANAGEMENT AND ECOSYSTEM RESTORATION
FEASIBILITY STUDY

SACRAMENTO DISTRICT

APPENDIX B

PROJECT DELIVERY TEAM

Name	Discipline	Phone (916)	Email
Laura Whitney	Project Manager – USACE	557-7455	Laura.A.Whitney@usace.army.mil
Michael Wright	Project Manager – CA DWR	574-1043	mcwright@water.ca.gov
Fraser Gensler	Study Manager/Planning	557-6849	R.Fraser.Gensler@usace.army.mil
Shelley McGinnis	Planning	557-5159	Shelley.R.Mcginnis@usace.army.mil
Peter Blodgett	Hydraulic Design and Technical Lead	557-7529	Peter.J.Blodgett@usace.army.mil
William Edgar	Sutter Butte FCA – Exec Dir	392-4909	bille@EandA.org
David Peterson	Sutter Butte FCA – Engineering Consultant	608-2212 X122	dpeterson@pbieng.com
Leslie Huynh	Civil Design	557-7274	Leslie.Huynh@usace.army.mil
Mario Parker	Environmental Specialist – USACE	557-6701	Mario.G.Parker@usace.army.mil
Patricia Gilbert	Environmental Specialist – CA DWR	653-5791	gilbertp@water.ca.gov
Laurine White	Hydrology/Reservoir Operations	557-7133	Laurine.L.White@usace.army.mil
Timi Shimabukuro	Economics	557-5313	Timi.S.Shimabukuro@usace.army.mil
Robert Vrchoticky	Cost Engineering	557-7336	Robert.D.Vrchoticky@usace.army.mil
Laurie Parker	Real Estate/Lands	557-6741	Laurie.S.Parker@usace.army.mil
S. Joe Griffin	Cultural Resources	557-7897	S.Joe.Griffin@usace.army.mil
Erik James	Geotechnical Soils Engineering	557-5259	Erik.W.James@usace.army.mil
Rick Meagher	Geology and HTRW	557-7288	Richard.F.Meagher@usace.army.mil
Tyler Stalker	Public Affairs Office	557-5107	Tyler.M.Stalker@usace.army.mil
Destani Hobbs	GIS Specialist	557-7959	Destani.M.Hobbs.usace.army.mil
April Murazzo	Environmental Specialist	557-7378	April.Murazzo@usace.army.mil

AGENCY TECHNICAL REVIEW TEAM

Name	Discipline	Phone	Email
Forest Brooks	ATR Leader/Plan Formulation	907-753-2627	Forest.C.Brooks@usace.army.mil
TBD	Civil Design		
TBD	Environmental Impact Analysis		
TBD	Ecosystem Restoration Planning		

TBD	Hydrology/Reservoir Operations		
TBD	Hydraulics		
TBD	Economics		
TBD	Cost Engineering [1]		
TBD	Real Estate/Lands		
TBD	Cultural Resources		
TBD	Geotechnical Soils Engineering		
TBD	Geology, HTRW		

[1]The cost engineering team member nomination will be coordinated with the NWW Cost Estimating Center of Expertise as required. That PCX will determine if the cost estimate will need to be reviewed by PCX staff.

INDEPENDENT EXTERNAL PEER REVIEW PANEL

Name	Discipline	Phone	Email
TBD	Hydrology		
TBD	Hydraulic Design		
TBD	Geotechnical Engineering		
TBD	Economics		
TBD	Ecosystem Restoration Planning		
TBD	Environmental Impact Analysis		

VERTICAL TEAM

Name	Discipline	Phone	Email
Karen Berresford	District Support Team Lead	415-503-6557	Karen.G.Berresford@usace.army.
Kenneth Zwickl	Regional Integration Team	202-7614085	Kenneth.J.Zwickl@usace.army.mil

PLANNING CENTER OF EXPERTISE FLOOD RISK MANAGEMENT

Name	Discipline	Phone	Email
Eric Thaut[1]	Program Manager, PCX Flood Risk Management	415-503-6852	Eric.W.Thaut@usace.army.mil
David Vigh,	Program Manager, PCX Ecosystem Restoration	601-634-5854	David.A.Vigh@usace.army.mil

[1] Primary PCX is FRM, who will coordinate with PCX for EC as appropriate.

Primary Review Member Discipline / Expertise Descriptions

Review Plan Team representation is required in the disciplines listed below. In general, the review team members will each have a minimum of 10 years experience and education in their respective discipline. A statement of qualifications is required for each discipline prior to acceptance as a review team member and for any subsequent changes thereto.

Hydrology & Hydraulics: Team member will be an expert in the field of urban hydrology & hydraulics, have a through understanding of the dynamics of the both open channel flow systems, enclosed systems, application of detention / retention basins, effects of best management practices and low impact development on hydrology, approaches that can benefit water quality, application of levees and flood walls in an urban environment with space constraints, non-structural measures especially as related to multipurpose alternatives including ecosystem restoration, non-structural solutions involving flood warning systems, and non-structural alternatives related to flood proofing. The team member will have an understanding of computer modeling techniques that will be used for this project (HEC-HMS, HEC-RAS, UNET, and TABS). A certified flood plain manager is recommended but not required.

Structural: Team member will have a thorough understanding of non-structural measures, levee, flood wall, and retaining wall design, and structures typically associated with levees (pump stations, gate well structures, utility penetrations, stoplog & sandbag gaps, and other closure structures). A certified professional engineer is recommended though not required.

Mechanical: Team member shall be experienced with civil works levee pump station and closure structure design. Engineering disciplines other than mechanical may be acceptable for review of this area of work subject to meeting the experience requirement stated above.

Electrical: Team member shall be experienced with civil works levee pump station and electrical utilities design.

Geotechnical: Team member will be experienced in levee & floodwall design, post-construction evaluation, underseepage remediation (e.g. seepage berms and cutoff wall design), and rehabilitation. A certified professional engineer is recommended.

Economics: Team member will be experienced in civil works and related flood risk reduction projects, and have a thorough understanding of HEC-FDA .

Plan Formulation: Team member will be experienced with the civil works process, watershed level projects, current flood damage reduction planning and policy guidance, and have experience in plan formulation for multipurpose projects, specifically integrating measures for flood risk management, ecosystem restoration, recreation, watersheds, and planning in a collaborative environment.

Environmental: Team member will be experienced in NEPA/CEQA process and analysis, and have a biological or environmental background that is familiar with the project area and ecosystem restoration.

Cultural Resources: Team member will be experienced in cultural resources and tribal issues, regulations, and laws.

Landscape Architect: Team member will be experienced in landscape architecture, ecosystem

restoration, habitat mitigation, recreation, and facility design.

Civil / Site / Utilities / Relocations: This discipline may require a dedicated team member, or may be satisfied by structural or geotechnical reviewer, depending on individual qualifications. Team member will have experience in utility relocations, positive closure requirements and internal drainage for levee construction, and application of non-structural flood damage reduction, specifically flood proofing. A certified professional engineer is suggested.

Cost Estimating: Team member will be familiar with cost estimating for similar civil works projects using MCACES. Team member will be a Certified Cost Technician, Certified Cost Consultant, or Certified Cost Engineer. A separate process and coordination is also required through the Walla Walla District DX for cost engineering.

Real Estate: Team member will be experienced in federal civil work real estate laws, policies and guidance. Members shall have experience working with respective sponsor real estate issues.

Other disciplines/functions involved in the project included as needed with similar general experience and educational requirements.

REVIEW PLAN

SUTTER BASIN, CALIFORNIA
FLOOD RISK MANAGEMENT, ECOSYSTEM RESTORATION AND RECREATION FEASIBILITY STUDY

SACRAMENTO DISTRICT

APPENDIX C
ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
ASA(CW)	Assistant Secretary of the Army for Civil Works	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
ATR	Agency Technical Review	OEO	Outside Eligible Organization
CA DWR	California Department of Water Resources	PCX	Planning Center of Expertise
CEQA	California Environmental Quality Act	PDT	Product Delivery Team
CESPD	Corps of Engineers, South Pacific Division	PAC	Post Authorization Change
DQC	District Quality Control	PPA	Project Partnership Agreement
DX	Directory of Expertise	PL	Public Law
EA	Environmental Assessment	QMP	Quality Management Plan
EC	Engineering Circular	QA	Quality Assurance
EDR	Engineering Documentation Report	QC	Quality Control
EIR	Environmental Impact Report	RD	Reclamation District
EIS	Environmental Impact Statement	RED	Regional Economic Development
EO	Executive Order	USACE	U.S. Army Corps of Engineers
ER	Ecosystem Restoration	WRCB	Water Resources Control Board
FDR	Flood Damage Reduction	WRDA	Water Resources Development Act
FEMA	Federal Emergency Management Agency		
FRM	Flood Risk Management		
GRR	General Reevaluation Report		
IEPR	Independent External Peer Review		
ITR	Independent Technical Review		
MSC	Major Subordinate Command		
NED	National Economic Development		
NER	National Ecosystem Restoration		
NEPA	National Environmental Policy Act		
O&M	Operation and maintenance		
OMB	Office and Management and Budget		