REVIEW PLAN

Success Dam, California
Baseline Risk Assessment Report and
Dam Safety Modification Report

Sacramento District

MSC Approval Date: 5 Oct 2013
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US Army Corps
of Engineers ®

REVIEW PLAN

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TABLE OF CONTENTS

1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level of peer review for the Success Dam, California Baseline Risk Assessment Report (BRAR) and Dam Safety Modification Report (DSMR). The Review Plan is a component of the Success Dam Project Management Plan (PMP).

b. References

(1) Engineering Circular (EC) 1165-2-214, Civil Works Review Policy, 15 December 2012
(2) EC 1105-2-412, Assuring Quality of Planning Models, 31 March 2011
(3) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 September 2006
(4) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 November 2007
(5) Success Dam Project Management Plan, April 2010
(6) CESPD Reg. 1110-1-8, Quality Management Plan, 30 December 2002
(7) ER 1110-2-1156, Safety of Dams – Policy and Procedure, 28 October 2011

c. Requirements. This review plan was developed in accordance with EC 1165-2-214, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. In addition to these levels of review, decision documents are subject to cost engineering review and certification (per EC 1165-2-214) and planning model certification/approval (per EC 1105-2-412).

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for decision documents is typically either a Planning Center of Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. The RMO for the peer review effort described in this Review Plan is the RMC.

The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies.

The RMC will be the RMO on technical issues dealing with review of scope and the ATR team composition. The ATR team will be compromised of individuals from outside the home district that have not been involved in the development of the decision document and will be chosen based on expertise, experience, and/or skills. The RMC, in cooperation with the PDT, and vertical team, will determine the final make-up of the ATR team.

3. STUDY INFORMATION

a. Decision Document. The decision documents for the Success Dam Safety Modification Study (DSMS) will consist of a DSMR including NEPA documentation, a Real Estate Design Memorandum

(REDM), and any other supporting document needed for approval. The Sacramento District's Project Delivery Team (PDT) is preparing a Baseline Risk Assessment Report (BRAR) which will feed into the baseline and without-project scenarios for the Success Dam Safety Modification Study . The BRAR will be the foundation of risk and resulting consequences for possible continuation into the DSMR study phase. A portion of this Review Plan will be dedicated to the review requirements for the BRAR. The Senior Oversight Group (SOG) for Dam Safety will review the BRAR contents and make a decision on the path forward for completing the DSMR. If the decision is made to move into the DSMR phase, the PDT will begin formulating risk reduction measures, alternative risk management plans and ultimately recommend a selected plan.

b. Study/Project Description. The existing project was constructed and began operation on 15 May 1961. Success Dam was authorized for construction by the Flood Control Act of 1944 (Public Law 534, 22 December 1944, Seventy-eighth Congress, Second Session). Success Dam and its reservoir, Lake Success, are on the Tule River, about 6 miles east and upstream of the City of Porterville in Tulare County, California. The dam provdes flood risk management benefits to the City of Porterville; in addition, the dam is part of a system of dams and reservoirs providing flood protection to the Tulare lakebed and adjacent areas from streams flowing westward out of the Sierra Nevada range. The other dams in this system are Pine Flat Dam on the Kings River, Terminus Dam on the Kaweah River, and Isabella Dam on the Kern River, all operated by the Sacramento District, U.S. Army Corps of Engineers (Corps).

Success Dam is a rolled earth-fill structure 145 feet high and 3,404 feet long. The dam has a top width of 22.5 feet with a 16-foot wide service road. The top elevation of the dam is 691.5 feet, providing 39 feet of freeboard above the normal gross pool at the spillway crest (El. 652.5 feet), and 4.7 feet of freeboard above the spillway design flood (El. 686.8 feet). A rolled earth-fill dike, called Frazier Dike, 42 feet high and 7,650 feet long, extends across Frazier Valley about 3.5 miles northwest of the dam.

The Success Dam project is an existing multi-purpose project providing flood control, irrigation water storage, recreation, and electrical power generation. At normal gross pool, the reservoir capacity is 82,300 acre-feet (surface area of about 2,400 acres. Originally, the total reservoir capacity at contruction was 85,400 acre-feet with 75,000 acre-feet reserved for flood control and storage for irrigation water and 10,400 acre-feet for sediment storage.

A project was authorized to increase the capacity of Success Dam Reservoir by raising the spillway an additional 10 feet in the Water Resources Development Act of 2000 (Public Law 106-53, Section 101(b)(4)). Construction was supposed to begin in Fiscal Year (FY) 2002, but has since been put on hold due to due to dam safety issues. It is believed that raising the spillway may reduce the hydrologic failure mode (overtopping) by widening the spillway. This may need to be reevaluated through an Economic Reevaluation Report or a Post Authorization Change Report at a later date, and will depend on the decision to pursue a DSMR after the BRAR is submitted.

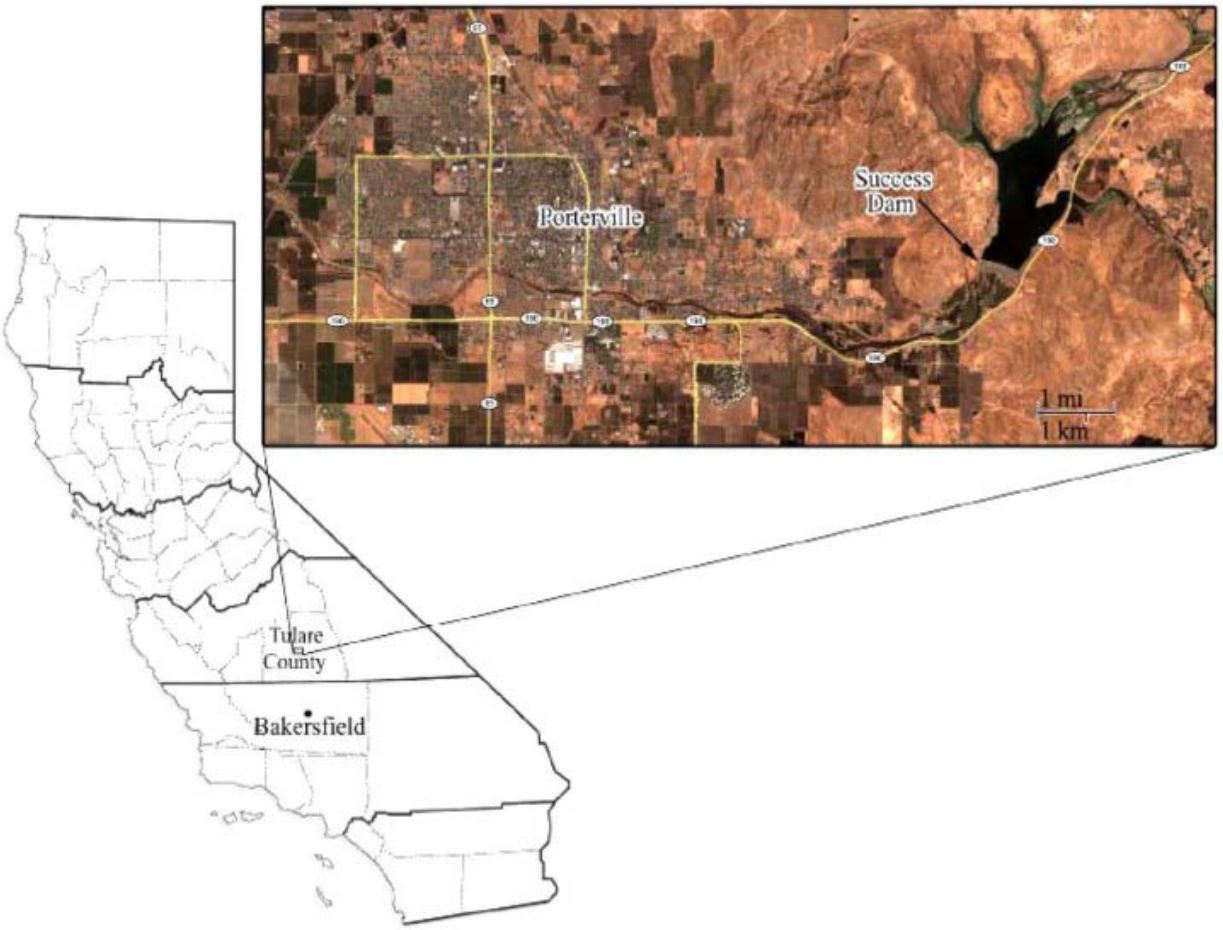

Figure 1 Location of Success Dam Project

c. Dam Safety Issues. Success Dam has been classified as a Dam Safety Action Classification (DSAC) II by HQUSACE (refer to Glossary). Studies conducted since 1992 indicated that the existing dam at Success is at an unacceptably high risk of failure due to hydrologic, seismic and seepage issues, but the current draft BRAR shows that only the overtopping (hydrologic) potential failure modes (PFMs) of the Main Dam and Frazier dike exceed tolerable risk guidelines.

(1) **Hydrologic:** The Probable Maximum Flood (PMF) for the Tule River at Success Dam is estimated to overtop both Success Main Dam and Frazier Dike, and failure could occur earlier than overtopping due to overwash (wind and wave action).

d. Factors Affecting the Scope and Level of Review. The following factors presented in Table 1 may impact the project study and level of review:

Table 1. Scope of Review Factors

Questions to Determine Scope	Success Dam Safety Modification Study
Will parts of the study be challenging?	The study will be challenging because of the urbanization of the project area, the complex seismic problems of the foundation, and the complex hydraulic system and associated floodplains. Also, due to the history of the area a potential risk exists for the discovery of prehistoric Native American remains. The additional risk posed by the reduced cross section will be mitigated by the following: 1) an additional pool restriction to El. 590 during construction, 2) an aggressive dewatering program of the downstream foundation excavation, and 3) a detailed slope/stability analysis. To minimize the risk of an archaeological discovery, contingency plans will be developed during preparation of plans and specifications.
Will the study report contain influential scientific information or be a highly influential scientific assessment?	The BRAR presents no influential scientific information or be a highly influential scientific assessment. It is not anticipated at this time that the DSMR will contain influential information, or otherwise be a highly influential scientific assessment. The PDT will be using conventional and acceptable engineering methods and practices for analysis in the BRAR and DSMR.
Will the study have significant economic, environmental, and/or social effects to the Nation?	The BRAR serves as a baseline estimate of the risks associated with Success Dam without intervention and in itself does not pose significant economic, environmental and/or societal effects. However, the Dam Safety Modification Study may have significant economic, environmental and/or societal impacts depending on what alternatives are developed and what plan is selected for modification.
Will the study have significant interagency interest?	The DSMS will have local, state and Federal interests.
Will the study have a significant threat to human life/safety assurance?	The current project presents a threat to human life/safety because of its considerable threat to human life in the event of a dam failure.
Will the study be highly controversial?	The DSMS has potential for public controversy.
Will the information in the decision document be based on novel methods, present complex challenges for interpretation, contain precent-setting methods or models, or present conclusions that are likely to change prevailing practices?	It is not likely that the Baseline Risk Assessment Report or the DSMR will result in precedent-setting methods, models, or practices if seismic considerations are not included.
What are the likely study risks and the magnitude of the risks?	The moderate to high risks identified by the PDT include: • Public controversy: The risk will be somewhat mitigated by careful communication with small

	public groups during the DSMS phase to gain project acceptance and careful communication with the general public. • The complex hydraulic system and associated floodplains are likely study risks associated with the DSMR.

e. In-Kind Contributions. Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. There are no anticipated in-kind contributions for this project at this time.

4. DISTRICT QUALITY CONTROL (DQC)

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC.

a. Documentation of DQC. The DQC will be managed by the Sacramento District in accordance with ER 1110-2-12 and the South Pacific Division and Sacramento District Quality Management Plans.

(1) **Phase 1 – BRAR:** The DQC will be documented in a memorandum showing the comment resolution process performed by senior level individuals of respective disciplines related to the products within the Sacramento District. The expertise required is listed in Table 13 and described in Section 4c below.

(2) **Phase 2 – DSMR:** The DQC for the DSMR will be documented using DrChecks.

b. Products to Undergo DQC.

(1) **Phase 1 – BRAR:**
- Hydrology Report (PMF update)
- Hydraulics Report (wind and wave analysis, outlet works rating and tailwater calculation, Frazier Dike breach, and Main Dam breach)
- FIA Consequence Analysis
- Geologic Cross-sections
- DamRAE Results/Appendix
- FLAC Analysis Report
- Probablistic Seismic Hazard Analysis Report
- Control Tower Analysis
- Seepage Modeling Report
- Baseline Risk Assessment Report

(2) **Phase 2 – DSMR:**
- Draft and Final Dam Safety Modification Report (including DSADS)
- Draft and Final Dam Safety Modification Report Appendices (to include plan formulation and NEPA documents)
- MCACES and Risk Based Cost Estimates

- Real Estate Design Memorandum
- Real Estate Plan
- Project Partnership Agreement
- Pre-engineering and Design (PED) Project Management Plan
- Water Control Manual
- Operation and Maintenance (O&M) Manual

Review of additional specific disciplines may be identified, if necessary. Please note that this DQC of the DSMR may not be necessary if the SOG indicates that a DSMS is not warranted upon completion of the BRAR.

c. Required DQC Expertise.

(1) **BRAR:** A list of the DQC team roster is provided in Table 13. The BRAR is considered a very technical document, and thus DQC team members represent the following disciplines: planning, economics, geotechnical,hydrologic, hydraulics, seismic, and geology.

(2) **DSMR:** A list of the DQC team roster is provided in Table 13. The DQC team members represent the following disciplines: Planning, economics, geotechnical, structural engineering, hydrologic, hydraulic engineering, construction, cost estimating, environmental Planning/NEPA, materials, seismic, real estate, geology, mechanical engineering, electrical engineering, hazardous toxic radioactive waste (HTRW), and cultural resources. *Please note that this review may not be necessary if the Senior Oversight Group (SOG) indicates that a DSMS is not warranted upon completion of the BRAR.*

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the designated RMO and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead will be from outside the home MSC.

a. Products to Undergo ATR. The ATR will be managed by the RMC and the ATR lead. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. The following products are anticipated to undergo ATR for their respective reports.

(1) **Phase 1 – BRAR:**
- Baseline Risk Assessment Report
- Baseline Risk Technical Appendices (all those listed in Section 4a)

(2) **Phase 2 – DSMR:**
- Draft and Final Dam Safety Modification Report (including DSADS)

- Draft and Final Dam Safety Modification Report Appendices (to include plan formulation and NEPA documents)
- MCACES and Risk Based Cost Estimates
- Real Estate Design Memorandum
- Real Estate Plan
- Project Partnership Agreement
- Pre-engineering and Design (PED) Project Management Plan
- Water Control Manual
- Operation and Maintenance (O&M) Manual

Review of additional specific disciplines may be identified, if necessary. Please note that this ATR of the DSMR may not be necessary if the SOG indicates that a DSMS is not warranted upon completion of the BRAR.

b. Required ATR Team Expertise. Table 2 and Table 3 indicate the ATR team and expertise required for the the anticipated documents during Phase 1 and Phase 2.

(1) **Phase 1 – BRAR:** Although the BRAR is not a decision document, the technical evaluation of the risks associated with Success Dam will need to be evaluated through the ATR process, and information used within this report will also be used as a basis for the DSMS. The BRAR is anticipated to undergo a small scale review through the Risk Estimating Team concurrently with the ATR (outlined in Table 12). This review will be completed upon submittal of the BRAR to the SOG for decision on DSAC rating and if the PDT should pursue a DSMR.

Table 2: Required ATR Expertise for the BRAR

ATR Team Members/Disciplines	BRAR Expertise Required
ATR Lead	The ATR Lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The ATR lead will also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline. This ATR member should also have experience conducting and reviewing risk assessments with respect to Issue Evaluation Studies or dam safety studies in general.
Economics	This team member shall be knowledgeable of policies and guidelines of ER 1110-2-1156 as well as experienced in analyzing flood risk management projects in accordance with ER 1105-2-100, the Planning Guidance Notebook. The economist shall be knowledgeable and experienced with standard Corps computer models and techniques used to estimate population at risk, life loss, and economic damages.
Hydrology	The hydrology team member will be an expert in the field of rainfall runoff models, flow-frequency analysis, hydrologic effects of flood control operations, and hydrologic analysis using HEC-HMS.
Hydraulic Engineering	The hydraulic engineer shall have experience in the analysis and

	design of hydraulic structures related to embankment dams including the design and performance of tainter gates. The hydraulic engineer shall be knowledgeable and experienced with the routing of inflow hydrographs through multipurpose flood control reservoirs utilizing multiple discharge devices, Corps application of risk and uncertainty analyses in flood damage reduction studies, and standard Corps hydrologic and hydraulic computer models used in drawdown studies, dam break inundation studies, hydrologic modeling and analysis for dam safety investigations.
Geotechnical Engineering	The geotechnical engineer shall have experience in the field of geotechnical engineering, analysis, design, and construction of embankment dams and dam safety engineering. The geotechnical engineer shall have experience in subsurface investigations, soil mechanics, internal erosion (seepage and piping), slope stability evaluations, erosion protection design, and earthwork construction. The geotechnical engineer shall have knowledge and experience in the forensic investigation of seepage, settlement, stability, and deformation problems associated with embankments constructed on similar geological formations. This ATR member should also have experience conducting and reviewing risk assessments with respect to Issue Evaluation Studies or dam safety studies in general.
Geologist	The engineering geologist shall have experience in assessing alluvial foundations and the conditions which could lead to internal erosion (seepage and piping) beneath embankment dams constructed on similar geologic formations. The engineering geologist shall be familiar with identification of geological hazards, exploration techniques, field and laboratory testing, and instrumentation.
Civil Engineering	The civil design member will have expertise in utility relocations, positive closure requirements, structural design, and non-structural flood damage reduction and knowledge of dam safety engineering. This ATR member should also have experience conducting and reviewing risk assessments with respect to Issue Evaluation Studies or dam safety studies in general.

(2) **Phase 2 – DSMR:** *This section and Table 3 will be updated in the future depending on if a DSMS is pursued after the SOG meeting.*

Table 3: Required ATR Expertise for the DSMR

ATR Team Members/Disciplines	DSMR Expertise Required
ATR Lead	The ATR Lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The ATR lead will also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline.
Planning	The Planning reviewer should be a senior water resources planner with experience in the civil works process, watershed level projects, and current flood damage reduction planning and policy guidance. Team member will have experience in plan formulation for multi-purpose projects and planning in a collaborative environment, as it applies to dam safety studies following ER 1105-2-100 and 1110-2-1156.
Economics	This team member shall be knowledgeable of policies and guidelines of ER 1110-2-1156 as well as experienced in analyzing flood risk management projects in accordance with ER 1105-2-100, the Planning Guidance Notebook. The economist shall be knowledgeable and experienced with standard Corps computer models and techniques used to estimate population at risk, life loss, and economic damages.
Environmental Resources	The environmental coordinator or specialist team member shall have knowledge of NEPA, Federal environmental laws, Executive Orders and Corps' environmental policies, including applicable Engineering Regulations and in accordance with the Planning Guidance Notebook, ER 1105-2-100, Implementing NEPA, ER 200-2-2, and others. The environmental reviewer shall have knowledge of implementing such areas regarding environmental justice, climate change, understanding of esthetic resources, and issues impacting public safety and welfare.
Cultural Resources	The cultural resources team member shall have knowledge of Section 106 of the National Historic Preservation Act, 36 CFR 800, NAGPRA, NEPA, Executive Orders regarding cultural resources and Tribal issues, and Corps' environmental policies as they relate to cultural resources, including applicable Engineering Regulations and in accordance with the Planning Guidance Notebook, ER 1105-2-100, Implementing NEPA, ER 200-2-2, and others.
Hydrology	The hydrology team member will be an expert in the field of rainfall runoff models, flow-frequency analysis, hydrologic effects of flood control operations, and hydrologic analysis using HEC-HMS.
Hydraulic Engineering	The hydraulic engineer shall have experience in the analysis and design of hydraulic structures related to embankment dams including the design and performance of tainter gates. The hydraulic engineer shall be knowledgeable and experienced with the routing of inflow hydrographs through multipurpose flood control reservoirs utilizing multiple discharge devices, Corps

	application of risk and uncertainty analyses in flood damage reduction studies, and standard Corps hydrologic and hydraulic computer models used in drawdown studies, dam break inundation studies, hydrologic modeling and analysis for dam safety investigations.
Geotechnical Engineering	The geotechnical engineer shall have experience in the field of geotechnical engineering, analysis, design, and construction of embankment dams and dam safety engineering. The geotechnical engineer shall have experience in subsurface investigations, soil mechanics, internal erosion (seepage and piping), slope stability evaluations, erosion protection design, and earthwork construction. The geotechnical engineer shall have knowledge and experience in the forensic investigation of seepage, settlement, stability, and deformation problems associated with embankments constructed on similar geological formations.
Geologist	The engineering geologist shall have experience in assessing alluvial foundations and the conditions which could lead to internal erosion (seepage and piping) beneath embankment dams constructed on similar geologic formations. The engineering geologist shall be familiar with identification of geological hazards, exploration techniques, field and laboratory testing, and instrumentation.
Civil Engineering	The civil design member will have expertise in utility relocations, positive closure requirements, structural design, and non-structural flood damage reduction and knowledge of dam safety engineering.
Structural Engineering	The structural engineer team member shall have experience in the evaluation of outlet works and spillway features for dams and in seismic analysis of embedded control structures, buried conduits, tunnels, bridges, and gravity dam design.
Electrical/Mechanical Engineering	The electrical/mechanical engineer team member shall have broad experience in the evaluation of existing tainter gates and those elements which support their operation.
Cost Engineering	The cost engineering team member will have extensive Corps' experience in the application of scientific principles and techniques to problems of cost estimating, cost control, business planning and management science, profitability analysis, project management, and planning and scheduling. Reviewer needs certification from the Cost Engineering Center of Expertise.
Construction/Operations	The construction team member should have a solid background in dam construction and/or remediation practices. This team member will provide perspective on constructability of the alternative plans that are developed throughout the DSMS process and will provide a practical approach to designs.
Real Estate	The real estate team member will be experienced in federal civil works real estate laws, policies, and guidance. They will manage issues with modifications, borrow area right-of-ways, easements,

	and any other real estate issues that arise from the DSMS.
Hazardous, Toxic and Radioactive Waste (HTRW)	An assessment for need will be made for hazardous, toxic, and radiological waste (HTRW) evaluation by the Geology and Investigations Section during Phase 1. If needed, team member will have expertise in assessment of HTRW to determine the nature and extent of HTRW materials within the project area.
Reservoir Control/Water Management	This team member will be have knowledge of real-time daily and flood operations, regulation decisions, gauging network and system infrastructure, national water control policy, water control data software, and systems operations.

c. Documentation of ATR. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

(1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
(2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
(3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and
(4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team will prepare a Review Report summarizing the review. Review Reports will be considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and

- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

ATR may be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team). Because the Success Dam PDT is completing a BRAR prior to preparation of a DSMR, a separate certification of ATR will be required for the BRAR although it is not a decision document. This Statement of Technical Review should be completed, based on work reviewed to date, for the AFB, draft report, and final report. A sample Statement of Technical Review for the BRAR is included in Attachment 2, and another for the DSMR is included in Attachment 3, if required.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR may be required for decision documents under certain circumstances. 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. A risk-informed decision, as described in EC 1165-2-214, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-214.

- Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to 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.

a. Decision on IEPR. Type I IEPR is conducted for decision documents if there is a vertical team decision that the covered subject matter meets certain criteria (described in EC 1165-2-214) where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside the USACE is warranted. EC 1165-2-214 requires a Type I IEPR whenever there is a

significant threat to human life. Table 4 outlines the rationale on the decision of Type I IEPR for the Success DSMR. The BRAR shows that Success poses that threat; accordingly, a Type I IEPR will be conducted. *Please note that IEPR Type I of the DSMR may not be necessary if the SOG indicates that a DSMS is not warranted upon completion of the BRAR.*

Table 4: Factors Determining the Need for Type I IEPR.

Questions to Determine IEPR	Success Dam Safety Modification Study
Is there significant threat to human life?	The project has been determined to have a high life safety risk.
Is the total project cost more than $45 million?	Project cost can not be estimated at this time as alternative risk management plans have not yet been developed.
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 the head of a Federal or state agency charged with reviewing the project/study has not requested a Type 1 IEPR.
Will there be a significant public controversy as to size, nature, or effects of the project.	Yes, the project has potential for public controversy.
Will there be a significant public controversy as to the economic or environmental cost or benefit of the project?	Yes, the project has potential for public controversy regarding the economic and environmental cost/benefit of the project.
Will the study be based on information from novel methods, present complex challenges, or interpretation, contain precedent-setting that are likely to change prevailing practices?	The study will not be based on information from novel methods, present complex challenges or interpretation, nor contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices.
What are the likely study risks and the magnitude of the risks?	TBD

b. Products to Undergo Type I IEPR. The Type I IEPR will be performed for the DSMR related drafts and final reports, including NEPA/environmental compliance documentation and technical appendices. Type I IEPR panel members will be provided with ATR documentation and significant public comments made during public meetings and on the products under review. Arising issues between PDT and reviewers should be resolved with face-to-face resolution. The BRAR will not require a Type I IEPR review as it is not a decision document, but will be incorporated into the DSMR to describe the baseline condition.

c. Required Type I IEPR Panel Expertise. The Type I IEPR panel members outlined in Table 5 will be comprised of individuals that have not been involved in the development of the decision document, meet the National Academy of Sciences guidelines for independence, and will be chosen by the OEO.

The OEO will determine the final participants on the Type I IEPR panel. The name, organization, contact information, credentials, and years of experience of each member will be identified at the time the review is conducted. Once the OEO designates the IEPR panel members, the review plan will be updated to reflect this selection. The types of expertise are anticipated to be similar to those

required for ATR. A safety assurance review will be include din the Type I IEPR process. Table 5 may be updated at a later date depending on the direction of the DSMS.

Table 5: Type I IEPR Team Descriptions

IEPR Panel Members/Disciplines	Expertise Required
Geotechnical Engineering Panel Member	• Minimum 15 years of demonstrated experience in dam engineering and in evaluating, designing, and constructing large embankment dams (>150 feet high) for water storage • Recognized expert in cutoff wall design and various methods of cutoff wall construction and soil improvement, including experience with various methods of cutoff wall construction • Knowledge and experience in the forensic investigation of seepage, settlement, stability, and deformation problems associated with embankments constructed on alluvial soils • Minimum of 15 years of experience in the general field of geotechnical engineering, including subsurface investigations; field and laboratory testing and the determination of in situ material properties; soil compaction and earthwork construction; soil mechanics; seepage and piping; bearing capacity and settlement; dewatering; design and construction of foundations on alluvial soils; foundation inspection and assessment; foundation grouting and other foundation treatment methods, including construction of seepage barriers; the design, installation, and assessment of instrumentation; and preparation of plans and specifications for USACE projects • Familiar with USACE dam safety assurance policy and guidance • Experience in evaluating risk reduction measures for dam safety assurance projects • Active participation in related professional societies • Registered professional engineer • Minimum M.S. degree or higher in engineering • Knowledge of USACE design and construction procedures and policies
Engineering Geology Panel Member	• Minimum 15 years of experience in engineering geology • Proficient in assessing seepage and piping through and beneath dams constructed on or within various geologic environments, including, but not limited to, alluvial soils and colluviums and other geological formations • Familiar with, and knowledgeable of, the identification of geologic hazards; exploration techniques, including soil and rock logging, geologic mapping, geophysical investigations and air photo interpretations; field and laboratory testing and the determination of in situ material properties; geomorphology; foundation inspection and assessment; foundation grouting and other foundation treatment methods, including construction of seepage barriers; and the design, installation, and assessment of instrumentation • Familiar with preparation of factual data and interpretative geology

	reports, including the preparation of Geotechnical Baseline Reports for USACE projects • Familiar with preparing plans and specifications for USACE projects • Knowledge of USACE design and construction procedures and policies • Knowledge of USACE dam safety assurance policy and guidance • Active participation in related professional engineering and scientific societies • Registered professional geologist
Hydraulic/Hydrologic Engineer	• Minimum 10 years of experience in hydraulic engineering with an emphasis on large public works projects • Extensive background in hydraulic theory and practice and river geomorphology • Experience associated with flood risk management projects and the analysis and design of hydraulic structures for flood control projects, including outlet works, spillways, stilling basins, flood control channels and levees, diversion channel design, and large river control structures • Performed work in hydrologic analysis, floodplain analysis, hydraulic design of channels and levees using various channel and bank protection works, and river sedimentation • Knowledge of, and experience with, physical modeling and the application of data from physical model testing to the design of stilling basins and scour protection; ability to coordinate, interpret, and explain testing results with other engineering disciplines, particularly structural engineers, geotechnical engineers, and geologists • Knowledge of, and experience with, the routing of inflow hydrographs through multipurpose flood control reservoirs utilizing multiple discharge devices, including gated sluiceways and gated spillways • Familiar with USACE application of risk and uncertainty in flood damage reduction studies and experience in evaluating risk reduction measures for dam safety assurance projects • Familiar with standard USACE hydrologic and hydraulic computer models used in drawdown studies, dam break inundation studies, hydrologic modeling, and analysis for dam safety investigations, including but not limited to HEC-1, HEC-HMS, HEC-2, HEC-RAS, FLO-2D, and HEC-DSS • Familiar with preparing plans and specifications for USACE projects • Knowledge of USACE design and construction procedures and policies • Knowledge of USACE dam safety assurance policy and guidance • Active participation in related professional engineering and scientific societies • Registered professional engineer • Minimum M.S. degree or higher in engineering
Civil/Structural Engineer Panel Member	• Recognized expert in the design and construction of hydraulic structures for large and complex Civil Works projects, including outlet works and spillways • Recognized expert in the stability analysis and structural design of

	mass concrete scour protection and stilling features, including the design of baffles, end sills, and training walls • Familiar with preparing plans and specifications for USACE projects • Knowledge of USACE design and construction procedures and policies • Knowledge of USACE dam safety assurance policy and guidance • Demonstrated knowledge in a variety of construction-related activities, including site layout, surveying, 3-dimensional modeling, construction techniques, grading, hydraulic structures, erosion control, interior drainage, earthwork, concrete placement, design of access roads, retaining wall design, and relocation of underground utilities • Experience in evaluating risk reduction measures for dam safety assurance projects • Practical knowledge of construction methods and techniques as they relate to structural portions of projects • Active participation in related professional engineering and scientific societies • Registered professional engineer • Minimum M.S. degree or higher in engineering
Economics/Planning Panel Member	• Minimum 10 years of experience in water resource economic evaluation and review • Direct experience working for or with USACE • Very familiar with the USACE plan formulation process, procedures, standards, guidance, and economic evaluation techniques • Familiar with the USACE flood risk and hurricane/coastal damage risk reduction analysis and economic benefit calculations, including the use of standard USACE computer programs including HEC-FDA • Experience with the National Economic Development (NED) analysis procedures, particularly as they relate to hurricane and coastal storm damage risk reduction • Demonstrated experience in public works planning, working with project teams to identify and evaluate measures and alternatives using appropriate planning methodologies to reduce life safety risk • Extensive experience in reviewing analyses used to evaluate measures and alternatives to ensure that they are sufficiently comprehensive and complete to result in approval of recommended alternative • Minimum 5 years of experience directly dealing with the USACE six-step planning process governed by ER 1105-2-100, Planning Guidance Notebook • Experience identifying and evaluating impacts to environmental resources from structural flood risk management and hurricane and coastal storm damage risk reduction projects • Active participation in related professional societies • Minimum B.S. degree or higher in economics
Environmental/NEPA Impact Assessment Panel Member	• Minimum 10 years of experience in water resource environmental evaluation and review • Minimum 10 years of experience in the implementation of the NEPA

	compliance process and Endangered Species Act requirements • Demonstrated experience in the EA process with knowledge of the NEPA process, cultural surveys, biological assessments, endangered species, working with coastal and estuarine ecosystems, and evaluating and conducting NEPA impact assessments, including cumulative effects analysis for complex multi-objective public works projects with competing trade-offs • Familiar with the USACE calculation and application of environmental impacts and benefits, determining the scope and appropriate methodologies for impact assessment and analyses for a variety of projects, potential project impacts to nearby sensitive habitats, and programs with high public and interagency interests • Experience in the northern California region • Minimum M.S. degree or higher in a related field

d. Documentation of Type I IEPR. The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO) per EC 1165-2-214, Appendix D. Panel comments will be compiled by the OEO and should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. IEPR comments should generally include the same four key parts as described for ATR comments in Section 4.d above. The OEO will prepare a final Review Report that will accompany the publication of the final decision document and shall:

- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions; and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

The final Review Report will be submitted by the OEO no later than 60 days following the close of the public comment period for the draft decision document. USACE shall consider all recommendations contained in the Review Report and prepare a written response for all recommendations adopted or not adopted. The final decision document will summarize the Review Report and USACE response. The Review Report and USACE response will be made available to the public, including through electronic means on the internet.

7. Type II Independent External Peer Review.

a. General. Once the DSMR has been approved, during design and construction a Type II IEPR Safety Assurance Review (SAR) of design and construction activities for flood risk management or coastal storm damage reduction projects or for other activities that affect public safety, will be conducted for reviewing the relevancy and effectiveness of the Corps inspection of completed works and safety programs in promoting safety and competent performance. They are not required to be managed by OEO's and may be managed by the Corps MSC or by an outside organization. While aspects of the project may be included in this review, it will focus on the public safety aspects. This section will be updated once the project has reached the design and construction phase.

SAR applies to new projects and the major repair, rehabilitation, replacement, or modification of existing facilities. The requirement for Type II IEPR is based on Section 2035 of the Water Resources Development Act of 2007 (WRDA 2007), the OMB Peer Review Bulletin and other USACE policy considerations. 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, 16 appropriateness, and acceptability of the design and construction activities in assuring public health, safety, and welfare. The Review Management Office for Type II IEPR reviews is the USACE Risk Management Center (RMC). Panel members will be selected using the National Academies of Science (NAS) policy for selecting reviewers. Type II IEPR is not exempted by statute from the Federal Advisory Committee Act (FACA).

b. Decision on Type II IEPR. The decision to conduct Type II IEPR is based on guidance from the Engineering Circulation, EC 1165-2-214. Success Dam needs a Type II IEPR because potential hazards pose a significant threat to human life. *Please note that Type II IEPR of the DSMR may not be necessary if the SOG indicates that a DSMS is not warranted upon completion of the BRAR.*

c. Products for Review. 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 is a "living document" and will be updated to discuss Type II IEPR in more detail once design of the remediation is in process.

d. Type II IEPR Panel Expertise. The Type II IEPR panel members will be comprised of individuals that have not been involved in the development of the decision document, meet the National Academy of Sciences guidelines for independence, and will be chosen by and outside organization. The types of expertise may be represented on the Type II IEPR team are described in Table 6.

Table 6: Type II IEPR Team Member Descriptions.

Type II IEPR Panel Members/Disciplines	Expertise Required
Civil Design Panel Member	The member(s) should be a registered professional engineer with a minimum MS degree or higher in civil or construction engineering. Member(s) should have 10-15 years experience in the embankment dam construction practices. The panel member(s) should be familiar with typical construction and construction management practices
Construction Management Panel Member	The member(s) should be a registered professional engineer with a minimum MS degree or higher in civil or construction engineering. Member(s) should have 10-15 year experience in the dam construction practices. The panel member(s) should be experienced with dam construction and best management practices.
Structural Engineer Panel Member	It is preferred that this member possess a PhD degree in engineering science, although an MS degree acceptable with professional registration as a Civil Engineer or Structural Engineer.

	The member should have a minimum of 15 years experience in static and seismic design per industry code standards and USACE design regulations for Civil Works projects, dynamic site-specific response spectra analysis and evaluation, and soil-structure interaction evaluation and design.
Geotechnical Engineering Panel Member	It is preferred that the member(s) possess a PhD degree in geotechnical engineering, although an MS degree is acceptable with professional registration as a geotechnical engineer. Minimum 20 years experience in geotechnical seismic design, and embankment dam design and evaluation. Additionally, at least 10 years experience in and piping and seepage failure mode analysis, and risk analysis of embankment dams, familiarity with USACE dam safety assurance policy and guidance, as well as competency in seismic modeling (preferably the finite difference model FLAC v6 commercially available through ITASCA).

Panel members identified in Table 6 are subject to change as the DSMS is in the initiation phase and this section will require update when the DSMR is approved and is ready for the pre-engineering and design (implementation) phase.

8. OTHER REVIEWS

a. Policy and Legal Compliance Review. All decision documents will be reviewed throughout the study process for their compliance with law and policy. Guidance for policy and legal compliance reviews is addressed in Appendix H, ER 1105-2-100. These reviews culminate in 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 home MSC Commander. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods and the presentation of findings in decision documents.

Please note that Policy and Legal Certification Compliance Review of the DSMR may not be necessary if the SOG indicates that a DSMS is not warranted upon completion of the BRAR.

b. Value Engineering (VE). A Value Engineering study will be conducted after the Alternative Formulation workshop as part of the DSMS. A report will be prepared to show the value engineering process that was used. The aim of the VE studies should be to ensure that the widest range of feasible and cost efficient engineering measures are considered and that alternatives formulated from those measures are not limited to those that first come to mind at the initiation of the study. Putting this step into the process ensures consideration of the fullest range of measures and alternatives. The results will be presented in the dam safety modification report (DSMR) and integrated into the discussion of the formulation of alternatives. *Please note that a VE may not be required if the SOG indicates that a DSMS for Success Dam not be pursued upon completion of the BRAR.*

c. Senior Oversight Group (SOG) Review. The SOG generally consists of the Special Assistant for Dam Safety, key Community of Practice leaders and various regional representatives as determined by

the Special Assistant. The function of the SOG is to review dam safety risk assessment reports prepared by the Risk Assessment cadres and other decision documents and make recommendations on dam safety modifications to the Special Assistant and the Corps DSO. The district will present the BRAR. After a determination is made at the initial SOG meeting that a DSMR be prepared by the PDT, SOG will subsequently review the risk management alternatives considered, and the recommended risk management plan to the dam safety SOG prior to the IEPR.

9. COST ENGINEERING DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION

All decision documents shall be coordinated with the Cost Engineering DX, located in the Walla Walla District. The DX will assist in determining the expertise needed on the ATR team and Type I IEPR team (if required) and in the development of the review charge(s). The DX will also provide the Cost Engineering DX certification. The RMO is responsible for coordination with the Cost Engineering DX.

10. MODEL CERTIFICATION AND APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models, for the purposes of the EC, 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. The use of a certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

a. Planning Models. The planning models are anticipated to be used in the development of the decision document (DSMR) are described in Table 7.

Table 7: Anticipated Planning Models

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
HEC-FDA 1.2.4 (Flood Damage Analysis)*	The Hydrologic Engineering Center's Flood Damage Reduction Analysis (HEC-FDA) program provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating flood risk management plans using risk-based analysis methods. The software developed by USACE provides the capability to perform an integrated	**Certified**

	hydrologic engineering and economic analysis during the formulation and evaluation of flood risk management plans. HEC-FDA computes the expected annual damages (EAD) corresponding to flood mapping.	
HEC-FIA*	The Hydrologic Engineering Center's Flood Impact Analysis software (HEC-FIA) calculates post-flood or forecasted-flood impacts for a user-specified event. It is also used to determine flood damage reduction benefits attributed to individual flood-control projects (reservoirs, levees, and diversions) and for real-time response activities as part of the U.S. Army Corps of Engineers Water Management System. For the specified event, HEC-FIA computes urban and agricultural flood damage, area inundated, number of structures inundated, population at risk, and life loss. The life loss computation in HEC-FIA is based on the LifeSim methodology developed at Utah State University, and includes consideration of many factors including initial distribution of population for day and night, redistribution of that population base on dam failure warning, evacuation potential, and sheltering opportunities. Damage analysis of crops involves a complex series of factors and considerations including the type of crop, season, cropping patterns, duration and magnitude of flooding, and much more. Monetary damage values for agriculture is determined from investment losses, mature-crop price values, harvest costs, and may include secondary business losses.	**Certified**
Various Environmental modeling	Other models, such as regional Input-Output models, may be added as needed as the study progresses. 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.	**TBD**
IWR-Planning Suite	This software assists in 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 best financial investments and displaying the effects of each on a range of	**Certified**

	decision variables.	

*Indicates the model is used for the BRAR and the DSMR.

b. Engineering Models. The engineering models are anticipated to be used in the development of the decision document are described in Table 8. Those models annotated with an asterisk indicate that they will be used for the preparation of the BRAR.

Table 8: Anticipated Engineering Models

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
HEC-HMS*	By applying this model, the PDT is able to define the watersheds' physical features, describe the meteorological conditions, estimate pertinent parameters, analyze simulations, and obtain GIS connectivity.	**Certified**
HEC-ResSim*	This model predicts the behavior of reservoirs and to help reservoir operators plan release in real-time during day-to-day and emergency operations. ResSim includes the following features: graphical user interface, map-based schematic and rule-based operations.	**Certified**
HEC-RAS*	This unsteady 1-D flow model will be used to simulate the channel hydraulics of the San Gabriel and Rio Hondo river channels.	**Certified**
FLO-2D	This unsteady 2-D flow model will be used to simulate wide alluvial fan floodplain inundation, and produce corresponding floodplain mapping.	**Certified**
UTEXAS4	This model is used to conduct slop stability analysis.	**Certified**
GeoSlope Suite	This program includes the Seep/W and Slope/W models for seepage and slope stability analyses. Both models are identified in SET and in wide use within the Corps and the A/E community.	**Certified**
Groundwater Modeling System (GMS)	This model is used to conduct seepage analysis.	**Certified**
Cost Estimating Model MCACES	MCACES (MII) are cost estimating models. This model was developed by Building Systems Design Inc.	**Certified**
SAP2000	This is integrated software for structural analysis and design. It is used for Deformation Analysis, Multiple P-Delta, Eigen and Ritz Analyses, Cable Analysis, Tension or Compression Only Analysis, Buckling Analysis, Blast Analysis, Fast Nonlinear Analysis for Dampers, Base Isolators and Support Plasticity, Energy Methods for Drift Control and Segmental Construction Analysis	**Certified**
Dam Safety Risk Analysis Engine (DAMRAE)*	The computer program *DAMRAE* (Dam Safety Risk Analysis Engine) Database was developed by the Utah Water Research Laboratory (UWRL) at Utah State University (Logan) for USACE, was used to perform risk analysis.	**Not currently certified**

*Indicates the model is used for the BRAR and the DSMR.

11. REVIEW SCHEDULES AND COSTS

This section outlines the schedule and costs associated with the review of the Phase 1 and 2 documents.

Table 9: Overall Success Dam DSMR Schedule (to include BRAR)

Date	Phase	Milestone
11 March 2013	1	Submit remaining components of BRAR for DQC
22 March 2013	1	DQC complete, BRAR and appendices DQC certified
25 March 2013	1	ATR & concurrent RET Review of BRAR and appendices
10 June 2013	1	ATR & Concurrent RET Review complete
22 June 2013	1	Read Ahead submittal of BRAR to SOG
22 July 2013	1	SOG meeting & decision on DSMR path
TBD	2	Prepare/Approve DSMS PMP
TBD	2	Update Review Plan with DSMS inclusion
TBD	2	Risk Reduction Measures Meeting
TBD	2	In Progress Review of Alternative Risk Management Plans
TBD	2	Risk Management Plan Meeting
TBD	2	Tentatively Selected Plan Meeting
TBD	2	Detailed Constructability Review
TBD	2	Initiate Type I IEPR
TBD	2	Draft DSMR/EA Complete
TBD	2	DQC of DSMR/EA
TBD	2	ATR DSMR/EA & Policy and Legal Compliance Review
TBD	2	Draft Final DSMR Complete
TBD	2	MSC and HQUSACE DSO Brief
TBD	2	SOG Presentation of Draft Final DSMR
TBD	2	Finish Type I IEPR
TBD	2	DSO Approval, Submittal to OMB and Congress

a. DQC Schedule and Cost. DQC shall be performed and certified before ATR submittal and does not have a set schedule, as it will be performed as the products are developed. Please see Table 9 for the DQC start and end dates.

(1) **Phase 1 – BRAR:** The estimated DQC cost is $40,000.

(2) **Phase 2 – DSMR:** The estimated DQC cost for the DSMR is anticipated to cost approximately $40,000.

b. ATR Schedule and Cost. ATR is estimated to start after DQC certification is obtained.

(1) **BRAR.** The ATR of the BRAR and technical appendices will begin 25 March 2013. It is anticipated that the review will span over a two week period and the cost of the ATR is estimated to be $20,000.

(2) **DSMR.** The estimated ATR cost within the Sacramento District is estimated to be $20,000 and $50,000 for the reviewers. This is an approximate total of $70,000 for the ATR effort. Please see Table 9 for the estimated schedule for ATR for the DSMS. It is anticipated that

once ATR is initiated, there will be a two week review period for the ATR members, a one week response period, followed by a final two week backcheck, finalization and certification period. These details will be worked out when the document reaches this milestone and the ATR lead is identified.

c. **Type I IEPR Schedule and Cost.** The estimated Type I IEPR cost is $20,000 for the Sacramento District and $150,000 for the contracted effort. This is an approximate total of $170,000 for the Type I IEPR effort. Please see Table 9 for the estimated schedule for IEPR. These details will be worked out when the document reaches this milestone and the Type I IEPR lead is identified. This Review Plan will require an update once the feasibility phase is complete and the project moves into implementation, which will include the Type II IEPR review cost and schedule.

d. **QCC Review.** The estimated cost of the QCC review is approximately $40,000. Please see Table 9 for the estimated schedule for the Policy and Legal Compliance Review.

e. **Model Certification/Approval Schedule and Cost.** This section may be updated at a later date as the study progresses; however, no models require certification at this point. The budget estimate may need to be updated based on model certification, if necessary.

c. **Type II IEPR Schedule and Cost.** In planning for a Type II IEPR review, estimates will need to include the cost for the RMO to administer and manage the Type II review and the cost of the independent panel. The cost of a Type II review through completion of construction should be reasonable and scalable, a function of complexity and duration, and managed as opposed to a carte-blanch approach. Table 10 provides as a guideline for scaling the Type II review. This section will be updated as a recommended alternative management plan is chosen and a project cost is identified.

Table 10: Cost Guidelines for Type II IEPR

Type II Review Cost Guideline	
Total Project cost	*Range*
$0 to < $15 million	0.90 to 1.50%
$15 million to $45 million	0.5 to 1.20%
> $45 million	0.10 to 0.85%

12. PUBLIC PARTICIPATION

The USACE will conduct stakeholder meetings to present the results of investigations on the Success Dam deficiencies and the preliminary risk reduction measures that are being considered in the formulation of the remediation alternatives for the DSMS. There will be a discussion of the Issue Evaluation and Dam Safety Modification processes, Q&A, and opportunity to submit comments and solicit input regarding issues of concern. It is anticipated that the project will require a NEPA document in which the Public will be provided an opportunity to comment. Additional meetings will be held as necessary.

The public review of necessary state or Federal permits will also take place. A formal State and Agency review will occur concurrently with the public review. Upon completion of the review period, comments will be consolidated in a matrix and addressed. 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 decision and NEPA documents. A plan for future public participation will be developed, which might identify informal as well as additional formal forums for participation.

13. REVIEW PLAN APPROVAL AND UPDATES

The South Pacific Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval are documented in Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the RMO and home MSC.

14. REVIEW PLAN POINTS OF CONTACT

Public questions and/or comments on this review plan can be directed to the following points of contact:

Name	Position	Phone	Email
Glen Reed	Sacramento District Project Manager	**916-557-5332**	**Anthony.G.Reed@usace.army.mil**
Quana Higgins	LA District Lead Planner	**602-230-6905**	**Quana.N.Higgins@usace.army.mil**
Ronn Rose	Sacramento District Lead Engineer	**916-557-5396**	**Ronn.S.Rose@usace.army.mil**
Rick Britzman	South Pacific Division Dam Safety Program Manager	**916-557-6607**	**Richard.A.Britzman@usace.army.mil**
Mark Ahlstrom	Risk Management Center Civil Engineer	**303-963-4546**	**Mark.E.Ahlstrom@usace.army.mil**
Colin Krumdieck	Success Dam ATR Lead	**303-963-4541**	**Colin.W.Krumdieck@usace.army.mil**

ATTACHMENT 1: TEAM ROSTERS

Table 11: Project Delivery Team

Name/Title	Section	Email/Phone
Glen Reed /Project Management	Project Management (Veronica Petrovsky)	Anthony.G.Reed@usace.army.mil 916-557-5332
Ronn Rose /Engineering Lead	Dam Safety Section (Jack Carroll)	Ronn.S.Rose@usace.army.mil 916-557-5396
Roxanne Bump /Budget Analyst	Program Management (Veronica Petrovsky)	Roxanne.N.Bump@usace.army.mil 916-557-7583
Aaron Schlein /Economist	Water Resources Branch (Nick Applegate)	Aaron.P.Schlein@usace.army.mil 916-557-5372
Calvin Foster /Area Park Manager	Southern Operations Area Office (Randy Olsen)	Calvin.Foster@usace.army.mil 559-784-0215
Michael Lin /Hydraulics	Hydraulic Design (Steve Graff)	Michael.C.Lin@usace.army.mil 916-557-7967
B.J. Bailey /Geologist	Geology Section (Cynthia Brooks)	Betty.J.Bailey@usace.army.mil 916-217-6642
Andy Farhan /Soils Engineer	Soil Design Section (David Serafini)	Andy.Farhan@usace.army.mil 916-557-5399
Vlad Perlea /Dam Safety	Soil Design Section (David Serafini)	Vlad.G.Perlea@usace.army.mil 916-557-5320
Richard M. Perry /Archeologist	Cultural Resources (Jane Rinck)	Richard.M.Perry@usace.army.mil 916-557-5218
TBD/GIS Mapping	GIS & Mapping Section	
Michael Ma /Structural Design	Structural Design (Chung Wong)	Michael.Ma@usace.army.mil 916-557-7298
TBD /Support Staff	Public Affairs Office (Dede Cordell)	
Bill Halczak /Materials	Soil Design Section (Dereck Morley)	William.Halczak@usace.army.mil 916-557-7427
Jeff Koschak /Environmental Manager	Environmental Planning Section (Bob Koenigs)	Jeff.A.Koschak@usace.army.mil 916-557-6994
Quana Higgins /Lead Planner	Water Resources Planning Section C, Los Angeles District	Quana.N.Higgins@usace.army.mil 602-395-1020
Martha Jackson /Planner	Water Resources Planning (Charles Wilson)	Martha.C.Jackson@usace.army.mil 916-557-6709
TBD /AE Services	AE Administration Section	
Harold Williamson Carolyn Mallory	Contracting	Harold.Williamson@usace.army.mil 916-557-5196 Carolyn.E.Mallory@usace.army.mil 916-557-5203
John C. Palma /Project Management Specialist	P2 (Tim Karpin)	John.C.Palma@usace.army.mil 916-557-6621
Jeremy Hollis /Real Estate Specialist	Real Estate (Paul Zianno)	Jeremy.I.Hollis@usace.army.mil 916-557-6884
Sid Jones/Landscape Architect	Civil Design Section	Sidney.I.Jones@usace.army.mil 916-557-7273
Wayne Johnson	Water Management Section	Wayne.L.Johnson@usace.army.mil

/Water Manager		916-557-7139

Table 12: Risk Estimating Team Roster

Name	Position/Title	Email/Phone
John Cyganiewicz	RET Lead/Faciliator	jcyganiewicz@comcast.net
Joseph Koester	Geotechnical Engineer HQUSACE	Joseph.P.Koester@usace.army.mil 202-761-4828
Jeffrey Schaefer	Geotechnical Engineer RMC	Jeffrey.A.Schaefer@usace.army.mil 502-315-6452
John France	Geotechnical Engineer URS Corp	John.France@urs.com
Ross Boulanger	Geotechnical Engineer UC Davis	RWBoulanger@ucdavis.com
Peter Shaffner	Geologist RMC	Peter.T.Shaffner@usace.army.mil 303-921-1566

Table 13: DQC Review Team Roster

Name	Discipline	Phone	Years of Experience
TBD	Lead DQC		
Martha Jackson	Planning	916-557-6709	3 years
Alarice Hansberry	Office of Counsel		
TBD	Structural		
TBD	Hydraulic		
Matthew Fleming	Hydrology		
Matt Davis	NEPA Document(s)		28 years
Nick Applegate	Economics		
Kevin Hazleton	Soils Design/Geotechnical Engineer		
Verne Brown	Geologist		
Kevin Hazelton	Risk Analysis		

Table 14: ATR Team Roster

Name	Discipline	Phone	Email
Colin Krumdieck	ATR Lead*	**303-963-4541**	**Colin.W.Krumdieck@usace.army.mil**
TBD	Geotechnical Engineer*	**TBD**	**TBD**
TBD	Water Control Engineer	**TBD**	**TBD**
TBD	Civil Design Engineer	**TBD**	**TBD**
TBD	Geologist*	**TBD**	**TBD**
TBD	HTRW Specialist	**TBD**	**TBD**
TBD	Structural Engineer	**TBD**	**TBD**
TDB	Hydrology*	**TBD**	
TBD	Hydraulics Engineer*	**TBD**	**TBD**
TBD	Electrical/Mechanical Engineer	**TBD**	**TBD**
TBD	Cost Engineering	**TBD**	**TBD**
TBD	Construction	**TBD**	**TBD**

TBD	Planning	**TBD**	**TBD**
TBD	Economics*	**TBD**	**TBD**
TBD	Environmental Resources	**TBD**	**TBD**
TBD	Cultural Resources	**TBD**	**TBD**
TBD	Real Estate Specialist	**TBD**	**TBD**

***indicate reviewers for BRAR**

Table 15: Type I IEPR Panel Roster

Name	Discipline	Phone	Email
TBD	Type I IEPR Lead TBD	**TBD**	**TBD**
TBD	Geotechnical Engineer	**TBD**	**TBD**
TBD	Geologist	**TBD**	**TBD**
TBD	Hydraulics Engineer	**TBD**	**TBD**
TBD	Structural Engineer	**TBD**	**TBD**
TBD	Cost Engineering	**TBD**	**TBD**
TBD	Economics	**TBD**	**TBD**
TBD	Environmental/NEPA	**TBD**	**TBD**
TBD	Real Estate Specialist	**TBD**	**TBD**

Table 16: Type II IEPR Panel Roster

Name	Discipline	Phone	Email
TBD	Type II IEPR Lead – Civil Design	**TBD**	**TBD**
TBD	Geotechnical Engineer	**TBD**	**TBD**
TBD	Engineering Geologist	**TBD**	**TBD**
TBD	Structural Engineer	**TBD**	**TBD**

Table 17: Vertical Team Roster

Name	Discipline	Phone	Email
Rick Britzman	MSC Dam Safety Program Manager	**916-557-6607**	**Richard.A.Britzman@usace.army.mil**
Annette Kuz	DST Office of Counsel	**415-503-6570**	**Annette.B.Kuz@usace.army.mil**
Rod Markuten	DST Construction	**415-503-6569**	**Rod.E.Markuten@usace.army.mil**
Karen Berresford	DST	**415-503-6557**	**Karen.G.Berresford@usace.army.mil**
Clyde Okazaki	DST	**415-503-6505**	**Clyde.Y.Okazaki@usace.army.mil**
Eric Halpin	HQUSACE Dam and Levee Safety	**202-761-7662**	**Eric.C.Halpin@usace.army.mil**
Maria Wegner-Johnson	HQUSACE Planning	**202-761-5541**	**Maria.M.Wegner-Johnson@usace.army.mil**
Charles Pearre	HQUSACE Dam Safety	**202-761-4831**	**Charles.M.Pearre@usace.army.mil**
Barbara Schuelke	HQUSACE Dam Safety Program Manager	**202-761-4643**	**Barbara.R.Schuelke@usace.army.mil**
Matthew Sheskier	RMC Civil Engineer	**720-398-7525**	**Matthew.A.Sheskier@usace.army.mil**
Bradd Schwichtenberg	HQUSACE, SPD RIT	**202-761-1367**	**Bradd.R.Schwichtenberg@usace.army.mil**
Tim O'Leary	RMC Senior Advisor	**502-315-6599**	**Timothy.M.Oleary@usace.army.mil**

Mark Ahlstrom	RMC Civil Engineer	**303-963-4546**	**Mark.E.Ahlstrom@usace.army.mil**

Table 18: Centers of Expertise POCs

Name	Discipline	Phone	Email
Nathan Snorteland	Director, RMC	571-232-9189	**Nathan.Snorteland@usace.army.mil**
Eric Thaut	Program Manager, FRM-PCX	415-503-6852	**Eric.W.Thaut@usace.army.mil**
Jodi Creswell	Operational Director, ECO-PCX	309-794-4558	**Jodi.K.Creswell@usace.army.mil**
Michael Jacobs	Cost Engineering Mandatory Center of Expertise	509-527-7516	**Michael.P.Jacobs@usace.army.mil**

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECSION DOCUMENTS

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the *Baseline Risk Assessment Report* for *Success Dam*. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-214. During the ATR, 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 results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks[sm].

SIGNATURE _____ Date _____

Colin Krumdieck
ATR Team Leader
RMC

SIGNATURE _____ Date _____

Glen Reed
Project Manager
CESPK-PM

SIGNATURE _____ Date _____

Name
Architect Engineer Project Manager[1]
Company, location

SIGNATURE _____ Date _____

Nate Snorteland
Review Management Office Representative
RMC

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows: *Describe the major technical concerns and their resolution.*

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

SIGNATURE _____ Date _____

Rick Poeppelman
Chief, Engineering Division
CESPK-ED

SIGNATURE _____ Date _____

Alicia Kirchner
Chief, Planning Division
CESPK-PD

[1] Only needed if some portion of the ATR was contracted

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
AFB	Alternative Formulation Briefing	NER	National Ecosystem Restoration
ASA(CW)	Assistant Secretary of the Army for Civil Works	NEPA	National Environmental Policy Act
ATR	Agency Technical Review	O&M	Operation and maintenance
CSDR	Coastal Storm Damage Reduction	OMB	Office and Management and Budget
DPR	Detailed Project Report	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DQC	District Quality Control/Quality Assurance	OEO	Outside Eligible Organization
DX	Directory of Expertise	OSE	Other Social Effects
EA	Environmental Assessment	PCX	Planning Center of Expertise
EC	Engineer Circular	PDT	Project Delivery Team
EIS	Environmental Impact Statement	PAC	Post Authorization Change
EO	Executive Order	PMP	Project Management Plan
ER	Ecosystem Restoration	PL	Public Law
FDR	Flood Damage Reduction	QMP	Quality Management Plan
FEMA	Federal Emergency Management Agency	QA	Quality Assurance
FRM	Flood Risk Management	QC	Quality Control
FSM	Feasibility Scoping Meeting	RED	Regional Economic Development
GRR	General Reevaluation Report	RMC	Risk Management Center
Home District/MSC	The District or MSC responsible for the preparation of the decision document	RMO	Review Management Organization
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RP	Review Plan
IEPR	Independent External Peer Review	RTS	Regional Technical Specialist
ITR	Independent Technical Review	SAR	Safety Assurance Review
LRR	Limited Reevaluation Report	SPD	South Pacific Division
MSC	Major Subordinate Command	SPK	Sacramento District
NED	National Economic Development	USACE	U.S. Army Corps of Engineers
		WRDA	Water Resources Development Act