



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO  
CORPS OF ENGINEERS  
1325 J STREET  
SACRAMENTO, CALIFORNIA 95814-2922

OCT 01 2010

CESPK-ED

MEMORANDUM FOR the Public

SUBJECT: Public Comment for the Review Plan (RP) for Yuba River Basin, California, Marysville Ring Levee

1. USACE EC 1165-2-209, dated 31 January 2010, page 4, section 7.a.(2).(d), states the following: "In developing an RP, the home district shall provide an opportunity for public comment by posting the approved RP on its public website, and for considering those comments in the decision of the type of review to be carried out. This is not a formal comment period and there is no set timeframe for the opportunity for public comment. If and when comments are received, the PDT should consider them and decide if revisions to the review plan are necessary. This engagement will ensure that the peer review approach is responsive to the wide array of stakeholders and customers, both within and outside the Federal Government."

2. The public is welcome to comment on this Review Plan. Email your comments to [Laura.M.Haven@usace.army.mil](mailto:Laura.M.Haven@usace.army.mil).

RICK L. POEPPELMAN, P.E.  
Chief, Engineering Division



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
SOUTH PACIFIC DIVISION, CORPS OF ENGINEERS  
1455 MARKET STREET  
SAN FRANCISCO, CALIFORNIA 94103-1399

CESPD-PDC

25 August 2010

MEMORANDUM FOR Commander, Sacramento District, ATTN: CESPK-ED-GP,  
Ms. Diana Modini

SUBJECT: Review Plan approval for Yuba River Basin, California, Marysville Ring Levee  
Design

1. The enclosed Review Plan for the Yuba River Basin, California, Marysville Ring Levee Design, 25 Jun 2010, has been prepared in accordance with EC 1165-2-209. The Review Plan has been coordinated internally within the DST and with the RMC. The CESPD-RBT will serve as the interim RMO.
2. The Review Plan includes independent external peer review.
3. I hereby approve this Review Plan, which is subject to change as circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to this Review Plan or its execution will require new written approval from this office.
4. The Point of Contact for this action is Karen Berresford, CESPD-PDC, (415) 503-6557, [Karen.G.Berresford@spd02.USACE.army.mil](mailto:Karen.G.Berresford@spd02.USACE.army.mil).

***Building Strong on the Cornerstone of the Southwest!***

FOR THE COMMANDER:

Encl

1. Review Plan, 25 Jun 2010

*Clyde Alazadei*  
*for* Mr. Andrew Constantaras P.E.  
Director of Regional Business

## **REVIEW PLAN**

Yuba River Basin, California  
Marysville Ring Levee  
Design

Prepared by:

U.S. Army Corps of Engineers  
Sacramento District

25 June 2010

Prepared by Diana Modini

YUBA RIVER BASIN, CALIFORNIA  
MARYSVILLE RING LEVEE  
DESIGN

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**REVIEW PLAN**  
**YUBA RIVER BASIN, CALIFORNIA**  
**MARYSVILLE RING LEVEE**  
**DESIGN**

**1. INTRODUCTION.**

a. Purpose. This Review Plan (RP), which is a component of the Project Management Plan (PMP), defines the scope and level of quality management activities for the Yuba River Basin, California, Marysville Ring Levee (MRL) project (P2 project number 105637); primarily for Phase 1 design but includes information that is planned for the remaining ring levee phases. Note that in September 2009 a RP for the Engineering Document Report (EDR) was approved by SPD, which was before EC 1165-2-209 was in effect. The EDR for the ring levee and Phase 1 design were being prepared simultaneously. As of 6 January 2010 the Draft EDR was completed and as of 5 February 2010 Phase 1 was at 90% design.

b. References. The following references are for ensuring product credibility, accountability, and quality.

- (1) ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug 1999
- (2) ER 1110-1-12, Engineering and Design Quality Management, 21 Jul 2006
- (3) Section 2034 and 2035, WRDA 2007 H. R. 1495 Public Law 110-114, 8 Nov 2007
- (4) EC 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- (5) Army Regulation 15-1, Committee Management, 27 November 1992 (Federal Advisory Committee Act Requirements)
- (6) National Academy of Sciences, Background Information and Confidential Conflict Of Interest Disclosure, BI/COI FORM 3, May 2003

c. Review Requirements. This Review Plan was developed in accordance with EC 1165-2-209, which establishes the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision and implementation documents through independent review. This RP describes the scope of review for the current phase of work with some future planned work. All appropriate levels of review (DQC, ATR, IEPR and Policy and Legal Review) will be included in this RP and any levels not included will require documentation in the RP of the risk-informed decision not to undertake that level of review. This RP identifies the most important skill sets needed in the reviews and the objective of the review and the specific advice sought, thus setting the appropriate scale and scope of review for the individual project.

**2. PROJECT DESCRIPTION.**

a. Project Authority. The Yuba River Basin, California project was authorized by Section 101(a) (10)

of the Water Resources Development Act (WRDA) of 1999, 106 Pub. Law 53, 113 Stat. 275, 1999 S. 507. The authorized project included levee modifications to the Marysville Ring Levee as an element of the larger Yuba River Basin project. The authorization was modified by Section 3041, WRDA 2007, 110 Pub. Law 114, 110 H.R. 1495.

The Marysville Ring Levee element was included as a separable element of the 1998 Feasibility Study for the Yuba River Basin Project. Though portions of the Yuba River Basin Project are currently being reevaluated, the Marysville Ring Levee is proceeding with design and can advance to construction for the following reasons: (1) the design has not changed substantially from what was described in the authorizing reports, and new technical information regarding the stability of the levee has been resolved through design changes and (2) it is hydraulically separate from the rest of the Yuba River Basin Project. Phase 1 construction will be funded from the American Recovery and Reinvestment Act (ARRA) of 2009 (Pub. Law 111-5).

b. Location and Description. The Yuba River Basin project area and the City of Marysville are located about 50 miles north of Sacramento, California in Yuba County. Land use in the City of Marysville is entirely urban, dense, and fully developed. Of the existing 7.5 miles of levees protecting Marysville, approximately 5 miles of new slurry walls and stability berms would be required. The height of the levees will not be changed. For this RP, Phase 1 is from station 37+00 to 83+00 and is to improve the existing levee's seepage and stability by means of a geotechnical design. This includes a soil-cement-bentonite (SCB) wall to a depth from 110 to 118 feet below levee crown. The planned geotechnical design for Phase 2 (station 196+00 to 274+00) will be a seepage cutoff wall to a depth from 61 to 86 feet below levee crown. The planned geotechnical design for Phase 3 (station 300+00 to 394+41 and 0+00 to 10+25) will be soil-bentonite (SB) wall to a depth from 66 to 106 feet below levee crown. The planned geotechnical design for Phase 4 (station 122+50 to 133+00) will be a 7 feet high by 15 feet wide landside stability berm. See figures 1 and 2 for project location.

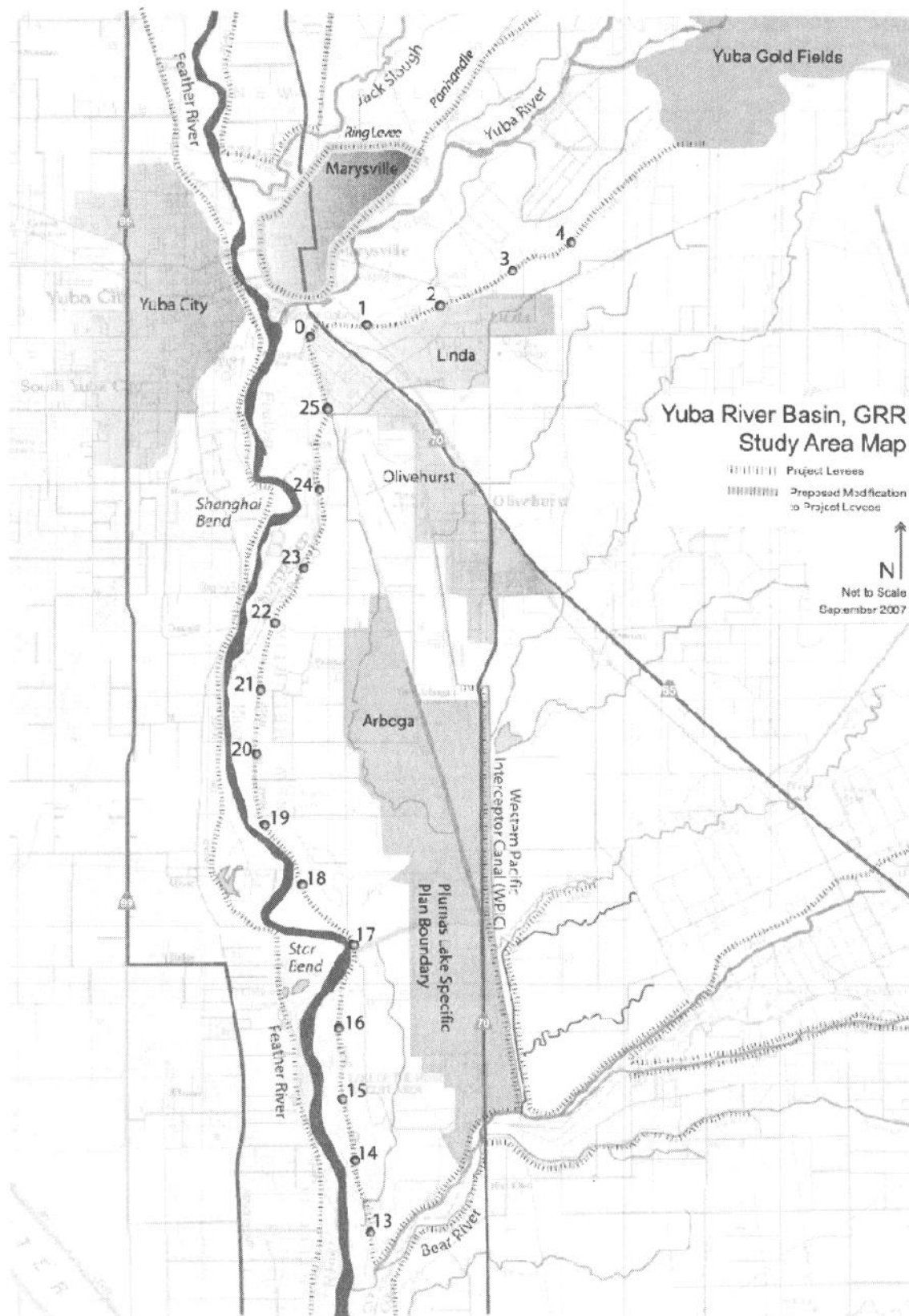


Figure 1. Yuba River Basin Study Area showing Marysville Ring Levee



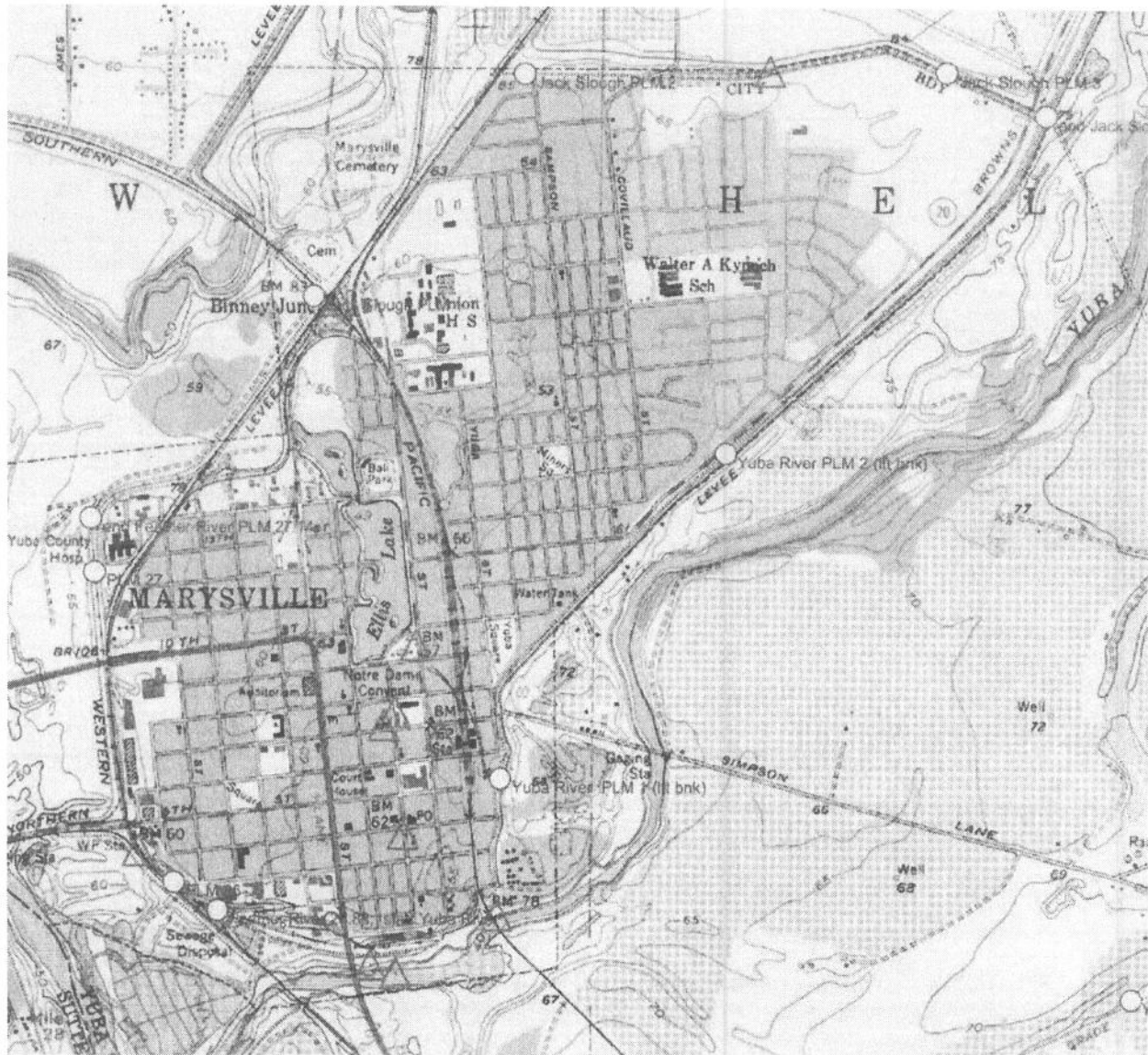


Figure 2. City of Marysville

**3. WORK PRODUCTS.** For Phase 1 the work products will be a Design Document Report (DDR) and plans and specifications (P&S) with construction expected in 2010 and 2011 and an estimated construction cost of \$18M. An AE will be utilized for the civil design except for the geotechnical engineering, which is by SPK. Products that the AE will produce are a QCP, P&S, and DDR. The Sponsor will be working on obtaining LERRD's. The following planned work products, which the RP will be updated, are the final designs of Phases 2, 3 and 4. Once funding is available the design of the remaining phases will occur with construction expected for Phase 2 (estimated construction cost of \$31.2M ) in 2012 and Phase 3 (estimated construction cost of \$17.2M) and 4 (estimated construction cost of \$500K) in 2013.

**4. MODEL CERTIFICATION.** Planning and engineering studies shall generally use well-known and proven USACE developed or commercial software. The use of sub-Community of Practice (sub-



CoP) preferred software is strongly recommended, unless circumstances dictate otherwise. The professional practice of documenting the application of the software and modeling results will be followed. It is the responsibility of the planning and engineering functions to ensure that the application and proper use of the software is documented in the technical review process.

The computational models employed in the Marysville project have either been developed by or for the USACE. Project schedules and resources will be adjusted to address this process for certification and coordination.

The USACE Planning Models Improvement Program (PMIP) was established in 2003 to assess the state of planning models in the USACE and to make recommendations to assure that high quality methods and tools are available to enable informed decisions on investments in the Nation's water resources infrastructure and natural environment. The main objective of the PMIP is to carry out "a process to review, improve and validate analytical tools and models for USACE Civil Works business programs."

A PMIP Task Force was established to examine planning model issues, assess the state of planning models in the Corps, and develop recommendations on improvements to planning models and related analytical tools. The PMIP Task Force collected the views of Corps leaders and recognized technical experts, and conducted investigations and numerous discussions and debates on issues related to planning models. It identified an array of model-related problems, conducted a survey of planning models, prepared papers on model-related issues, analyzed numerous options for addressing these issues, formulated recommendations, and wrote a final report that is the basis for the development of this RP section. The Task Force considered ongoing Corps initiatives to address planning capability, and built upon these where possible.

The planning model used is:

- HEC-FDA: This model has been certified. It was developed by the Corps' Hydrological Engineering Center and will assist the PDT in applying risk analysis methods for flood damage reduction studies as required by, EM 1110-2-1419. This program:
  - Provides a repository for both the economic and hydrologic data required for the analysis
  - Calculates the Expected Annual Damages and the Equivalent Annual Damages
  - Computes the Annual Exceedence Probability and the Conditional Non-Exceedence Probability
  - Implements the risk-based analysis procedures in EM 1110-2-1619 and ER 1105-2-101.

The Science & Engineering Technology (SET) initiative endeavors to provide uniform Science and Engineering tools and practices to the Corps. Engineering models will be certified under a process established under SET. To date no formal enterprise standard has been issued for certification of engineering models. An interim Regional process for HH&C model selection (RGM CESPDP-2007-006) will be followed.

The engineering models used are:

- MCACES or MII: These are cost estimating models.
- HEC-HMS: By applying this model the PDT is able to:
  - Define the watersheds' physical features
  - Describe the metrological conditions

- Estimate parameters
- Analyze simulations
- Obtain GIS connectivity
- 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
- HEC-RAS: The function of this model is to complete one-dimensional hydraulic calculations for a full network of natural and manmade channels. HEC-RAS major capabilities are:
  - User interface
  - Hydraulic Analysis
  - Data storage and Management
  - Graphics and reporting
- FLO-2D: This model will be used for the overbank reaches.
- Groundwater Modeling System (GMS): This model is used to conduct seepage analysis.
- Utexas4: This model is used to conduct slope stability analysis.
- Newmark: This model is used for seismic deformation analysis. Note that liquefaction analysis will also be conducted; however this is not a model.

**5. SCOPE OF REVIEW.** The review scope, for each design phase are peer reviews, District Quality Control (DQC), Quality Assurance (QA), Agency Technical Review (ATR), and Type II IEPR Safety Assurance Review (SAR). There will be a record of internal review (within each organization) and consolidation of consensus on comments. Policy and legal compliance review were conducted for the EDR (though and implementation document, it was reviewed by SPD and HQUSACE) and not required for P&S (implementation); however there will be a public review of this RP once it is approved by SPD. Note that this RP will be updated to address future implementation phases of the project.

a. District Quality Control Activities. All work products to produce a DDR and P&S will undergo seamless peer, senior, and/or supervisory reviews. Section chiefs will provide oversight on a daily basis and periodic oversight at Branch and Division level. For Phase 1 design, there was a Management Review at 90% design. Future design phases will undergo a 35% or 65% and 95% design Management Review. In addition, the products will undergo a DQC with those not directly involved with the production. The 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). This will include reviews of assumptions, analytic approaches, and calculations. The Architect/Engineer (AE) will produce a Quality Control Plan of their quality control procedures in which the Project Delivery Team (PDT) and DQC team will QA the AE's products. A Quality Control/Quality Assurance Plan for the EDR and P&S was developed in November 2009. The PDT and DQC reviews for Phase 1 were conducted at 60%, 90%, and 100% design. In addition a Value Engineering (VE) study is required if construction costs exceed \$2M. Therefore, a VE study was conducted for Phase 1 design and will be conducted on remaining phases that exceed \$2M. A Biddability, Constructability, Operability, and Environmental (BCOE) review was also conducted for the Phase 1 design. Review comments will be recorded into the required DrChecks system located at <https://www.projnet.org/projnet/binKornHome/index.cfm>. Following the reviews, a Review Conference will be conducted to clarify, discuss, and resolve comments and responses which will also

document significant decisions. The SPK Engineering Lead will manage these reviews. If issues cannot be resolved they will be elevated to Engineering Division Management and for the PM to facilitate a resolution with the team, management, and sponsor(s). See paragraph 7 for the review schedule.

b. Agency Technical Review Activities. An ATR is required for all implementation documents and is undertaken to “ensure the quality and credibility of the government’s scientific information” in accordance with EC 1165-2-209. The ATR is an in-depth review, managed within US Army Corps of Engineers (USACE), and conducted by a qualified senior team outside of the Sacramento District (SPK), and is not involved in the day-to-day production of a project. To assure independence, the ATR leader will be outside of the home Major Subordinate Command (MSC). The ATR is an independent review to ensure that the solutions are appropriate, assumptions, analytic approaches, calculations, and opportunities are addressed and/or incorporated. The ATR will ensure the proper application of established criteria, regulations, laws, codes, principles and professional practices. The ATR team will examine relevant DQC records and provide comments in the ATR report as to the adequacy of the DQC effort. Since 5 February 2010, the ATR team conducted a review at 90% design. Review comments will be recorded into the required Document Review and Checking System (DrChecks). The ATR Team Lead will manage this review and coordinate with the SPK Engineering Lead and Project Manager (PM). Once the review is completed, a statement of ATR will be signed by the ATR Team Lead and PM.

c. Independent External Peer Review Activities. EC 1165-2-209 requires that a Type II Independent External Review (IEPR), also known as a Safety Assurance Review (SAR), shall be conducted for any project addressing hurricane and storm risk management or flood risk management or any other project where the Federal action is justified by life safety or the failure of the project would pose a significant threat to human life.

(1) The project involves the use of innovative materials or techniques where the engineering is based on novel methods, presents complex challenges for interpretations, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices;

(2) The project design requires redundancy, resiliency, and robustness.

(a) Redundancy. Redundancy is the duplication of critical components of a system with the intention of increasing reliability of the system, usually in the case of a backup or failsafe.

(b) Resiliency. Resiliency is the ability to avoid, minimize, withstand, and recover from the effects of adversity, whether natural or manmade, under all circumstances of use.

(c) Robustness. Robustness is the ability of a system to continue to operate correctly across a wide range of operational conditions (the wider the range of conditions, the more robust the system), with minimal damage, alteration or loss of functionality, and to fail gracefully outside of that range.

(3) The project has unique construction sequencing or a reduced or overlapping design construction schedule; for example, significant project features accomplished using the Design-Build or Early Contractor Involvement (ECI) delivery systems.

In summary, the MRL project addresses storm or flood risk management and the failure of the levee could pose a threat to human life. For Phase 1, the geotechnical design is a soil-cement-bentonite (SCB) seepage cutoff wall within the levee centerline to a depth of approximately 110 to 118 feet below levee crown. Construction is expected to occur in 2010 starting at station 37+ 00 to

approximate station 70+00. Then construction will be completed in 2011, from approximate station 70+00 to 83+00. The reason for the construction sequencing is due to environmental and flood season (CVFPB prohibits work from 1 November to 15 April without a waiver) constraints and the time it takes to construct the SCB seepage cutoff wall. In June 2010, it is planned to prepare an AE contract to identify a SAR team and to facilitate the reviews. The SAR team is an independent external panel that conducts reviews at various work phases, and is to be approved by the Review Management Organization (RMO) which is the Risk Management Center (RMC). Currently the RMC is not fully staffed therefore MSC (which is SPD) will approve until otherwise notified. The SAR shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health, safety, and welfare. For Phase 1, the SAR will be conducted immediately on the design, (though the construction contract will most likely already be awarded) during construction beginning, midpoint, and end; however the team may decide a more appropriate review time. The SAR team will be provided with the EDR for reference such that a DDR and P&S can be reviewed. If the SAR team states there are significant flaws in the design then SPK may require incorporation and a construction modification would need to be issued. The AE facilitator will compile and coordinate the SAR comments and responses, which will be summarized in a Review Report for each review and a Final Review Report at the end of the SAR. The Review Reports will be provided to the Engineering Lead and PM, which the PM will submit to the MSC for approval and then the Review Reports will be posted on SPK's website.

d. Policy Compliance and Legal Review Activities. EC 1165-2-209 states "All decision documents will be reviewed throughout the study process for their compliance with law and policy". The MRL project EDR was reviewed for compliance with policy and law according to EC 1165-2-209. The MRL, Phase 1 design is essentially an implementation document and therefore do not need to be reviewed for compliance with law and policy.

## 6. REVIEW TEAMS.

a. Project Delivery Team. The Project Delivery Team (PDT) are members that produce various work products and they will review products. For the Phase 1 design the PDT consists of the following personnel. Note that some on the PDT will perform QA activities over the AE products.

### PROJECT DELIVERY TEAM

Name	Discipline	Phone
Mark Ellis	COE Project Manager	916-557-6892
Scott W. Parker	COE Planning Lead	916-557-7258
Richard Furman	COE Planning (PPA)	707-982-1451
Ted Werner	COE Planning	916-557-6753
John Jordan	COE Economics	916-557-7267
Jane Rinck	COE Environmental Lead	916-557-6715
Lindsay Dembosz	COE Environmental	916-557-5276
April Murazzo	COE Environmental	916-557-7484
Melissa Montag	COE Cultural	916-557-7907
Jeremy Hollis	COE Real Estate	916-557-6880
Steve Carey	COE Real Estate (maps)	916-557-6653
Erik James	COE Geotechnical	916-557-5259
Eugene Maak	COE Hydraulics	916-557-7020
Tom Kellogg	COE ESA	916-557-6943

Alison Plant	COE SWPP	916-557-7473
Diana Modini	COE Engineering Lead	916-557-6821
Johnnie Mack	HDR Project Manager	916-817-4887
Tom Adams	HDR Planner Lead	916-817-4737
Richard Dirks	HDR Tech Lead	916-817-4887
Blake Johnson	HDR Civil Eng	916-817-4887
Chris Krivanec	HDR Geotechnical Eng	916-817-4887
Stella Gardenour	HDR Project Coordinator	916-817-4887
Tom Engler	TRLIA Rep (MBK - PM)	916-456-0253
Ric Reinhardt	TRLIA Rep (MBK - PM)	916-456-0253
Chris Scobba	DWR (PM)	916-574-0370

b. District Quality Control. DQC will be managed by the home district, SPK, in accordance with the MSC and Quality Management Plans (QMP) which is a subset of the PMP. The DQC team should be comprised of senior experienced personnel and not involved with the project.

#### **DISTRICT QUALITY CONTROL/QUALITY ASSURANCE TEAM**

<b>Name</b>	<b>Discipline (Activity)</b>	<b>Phone</b>
Diana Modini	Civil (QA)	916-557-6821
Mary Perlea	Geotechnical (DQC)	916-557-1758
Mike Lin	H&H (DQC)	916-557-7409
Sid Jones	Landscape Architect (QA)	916-557-7273
John Esparza	ESA/SWPP (DQC)	916-557-7451
Sherman Fong	Cost Engineering (QA)	916-557-6983
Steve Freitas	Tech & Specs (QA)	916-557-7296
Melissa Hallas	Planning (DQC)	916-557-7774
Timi Shimabukuro	Economics (DQC)	916-557-5313
Matt Davis	Environmental (DQC)	916-557-6708
Stan Wallin	Real Estate (DQC)	916-557-5226
Drew Perry	Construction (DQC/QA)	916-557-7779

c. Agency Technical Review. The MSC for SPK is SPD and the RMO is the RMC. Currently the RMC is not fully staffed therefore MSC (which is SPD) will approve until otherwise notified. In addition, for Phase 1 design the ATR Team Lead is from the Louisville District (LRL) and the remaining team members are from the Los Angeles District (SPL). The ATR team is the same team as on the MRL EDR RP, except the Team Lead. The ATR team should be comprised of senior experienced personnel and not involved with the project. Included in this table are two additional ATR team members that will be utilized for future designs. This is the Center of Expertise (DX) for Cost Engineering and a Construction Engineer.

#### **AGENCY TECHNICAL REVIEW TEAM**

<b>Name</b>	<b>Discipline</b>	<b>District Location</b>	<b>Phone</b>	<b>Experience</b>
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Monica Greenwell	ATR Team Leader for design	CELRL H2L0FF0	502-315-6360	Experienced in the development of final plans and specifications for both civil works and military projects including navigation lock design, channel improvement flood damage reduction project, bridge modification and deck replacement. Currently the Chief of Civil Section. Prior work as a Structural Engineer for 11 years, and also civil designer for 6 years.
Roxanne Vidaurre	Civil Engineering	CESPL L1L0210	213-452-3643	Experienced in developing final design and cost estimates. Experience preparing detailed Basis of Design (BOD) reports for design features, plans and profiles of embankments, hydraulic structure features, relocations, channel details, bridge crossings, and operation and maintenance requirements.
Tiffany Kayama	Environmental Resources	CESPL L1K0310	213-452-3845	Experienced in NEPA/CEQA process and analysis and ecosystem restoration.
James Chieh	Hydrology/ Reservoir Operations	CESPL L1L0840	213-452-3571	Experienced in the field of urban hydrology and the effects of best management practices and low impact development on hydrology. Understands computer modeling techniques that will be used for this project.
Nathaniel Govan	Cost Engineering	CESPL L1L027B/ L1L0271	213-452-3739	Experienced with cost estimating for civil works projects using MCACES and is a Certified Cost Engineer.
Steven Gale	Real Estate/Lands	CESPL	602-640-2016	Experienced in federal civil work real estate laws, policies and guidance with experience working with respective sponsor real estate issues.
Steven Dibble	Cultural Resources	CESPL L1K0310	213-452-3849	Experienced in cultural resources and tribal issues, regulations, and laws.
Paul Beaver/Greg Dombrosky	Geotechnical Engineering	CESPL L1L0650	213-452-3588	Experienced in levee & dike design, post construction inspection, evaluation, and rehabilitation on levees, dikes, and earth fill dams.
TBD for future designs	Construction Engineering	TBD	TBD	TBD
James Neubauer	DX, Cost Engineering	CENWW-EC-X	509-527-7332	TBD by POC

d. Independent External Peer Review. The following are points of contacts. Approval authority for decision document RP's is the MSC (SPD) Karen Berresford. Approval authority for implementation document RP's is the MSC (SPD) Andy Constantaras. The RMO is the RMC, Nathan Snorteland. In June 2010, it is planned to prepare an AE contract to identify a SAR team, therefore the actual panel members are not known at this time. Also the SAR team members may change for the follow on design phases (Phases 2, 3, and 4). The selection of the SAR team will be made up of independent recognized international experts from outside of the USACE in the appropriate disciplines representing a balance of expertise suitable for the review being conducted; and selected using the National Academy of Science (NAS) policy which sets the standard for "independence" in the review process.

The SAR team shall be composed of three licensed engineers with experience in flood control design and construction projects. The three members shall represent the four disciplines primarily involved in levee remediation projects: geotechnical, construction, civil and hydraulics/hydrology.

One member shall be a geotechnical engineer specialist with a minimum 25 years of experience in design, inspection and construction of levee or dam projects. The member shall be a registered Professional Engineer (PE) and preferably a registered Geotechnical Engineer (GE), with a minimum of 10 completed dam or levee remediation design projects including: groundwater seepage analysis, slope stability analysis, seepage cutoff walls constructed with soil mixing and slurry methods, seepage or stability berms, drains, filters, geosynthetics and earthwork quality assurance and control.

The second member shall be a geotechnical engineer specialist or general civil engineer with significant experience with earthwork construction quality assurance and control with a minimum 20 years of experience in flood control projects, including dams or levees. The member shall have significant experience in evaluation of underground utilities, encroachments and other penetrations associated with dams or levees. The member shall be a registered Professional Engineer (PE).

The third member shall be a hydraulic engineer or construction engineer depending on whether the SAR is reviewing design or construction phase work, respectively. The hydraulic engineer shall have a minimum 20 years of experience in hydraulic and hydrological modeling for flood control projects on major river systems. The construction engineer shall have a minimum 20 years experience in the construction or remediation of dams, levees or related flood control structures. The member shall be a registered Professional Engineer (PE).

#### **TYPE II IEPR - SAFETY ASSURANCE REVIEW (SAR) TEAM**

<b>Name</b>	<b>Discipline</b>	<b>Phone</b>	<b>Email</b>
TBD by AE	Geotechnical Engineer		
TBD by AE	Geotechnical or Civil Engineer		
TBD by AE	Hydraulic or Construction Engineer		



**7. PUBLIC COMMENT.** To ensure that the peer review approach is responsive to the wide array of stakeholders and customers, both within and outside the Federal Government, this RP will be published on the SPK's public internet site following approval by SPD at <http://www.spk.usace.army.mil>. This is not a formal comment period and there is no set timeframe for the opportunity for public comment, however every month the comments will be forwarded to the PM such that the PDT will consider them and decide if revisions to the review plan are necessary. The public is invited to review and submit comments on the plan as described on the web site.

**8. SCHEDULE/COSTS.** For Phase 1, the cost for the DQC, VE, ATR, and SAR are estimated at \$30,000, \$30,000, \$40,000, and \$75,000 respectively. For Phases 2, 3, and 4 the cost for the DQC, VE, ATR and SAR are estimated at \$60,000, \$60,000, 80,000, and 200,000 respectively. The SAR cost will be shared with the local sponsor.

### REVIEW SCHEDULE

Title and Activity	Start Date	End Date
Phase 1 60% P&S (PDT & DQC/QA review)	11/2/09	11/16/09
VE Study	11/16/09	1/6/10
Prepare Review Plan	2/1/10	6/5/10
Prepare AE SOW for SAR	2/1/10	6/18/10
Phase 1 90% P&S (PDT, DQC/QA & ATR) & Back check	2/8/10	2/17/10
Phase 1 90% ED Management Review	2/11/10	2/11/10
Public Meeting	2/10/10	2/10/10
Phase 1 BCOE Review	2/8/10	2/17/10
Phase 1 100% P&S (PDT, DQC/QA & ATR ) & Back check	4/5/10	4/12/10
Phase 1 BCOE Back check & Certification	4/5/10	4/16/10
Phase 1 RTA P&S to Contracting	5/10/10	5/10/10
Phase 1 construction contract award	6/30/10	6/30/10
SAR of Phase 1 design	7/19/10	7/30/10
SAR near beginning of year 2010 construction	8/2/10	8/13/ 10
SAR near end of year 2010 construction	9/6/ 10	9/17/10
SAR near beginning of year 2011 construction	6/20/11	7/1/11
SAR near end of year 2011 construction	9/5/11	9/16/11
Update RP for Phases 2, 3, and 4	TBD	TBD
VE Study for Phases 2, 3, and 4	TBD	TBD
ATR for Phases 2, 3, and 4	TBD	TBD
SAR for Phases 2, 3, and 4	TBD	TBD

**9. DOCUMENTATION OF REVIEW.** The DQC activities for the MRL project Phase 1 design have been completed by SPK. The ATR activities for the MRL project Phase 1 design have been completed by LRL and SPL. The team used DrChecks to document the review process. Following the reviews, a Review Conference will be conducted to clarify, discuss, and resolve comments and responses which will also document significant decisions. Reviewers were then responsible for back checking the responses (i.e. evaluations), to the review comments and either close the comment or attempt to resolve any disagreements. If issues cannot be resolved they will be elevated to Engineering Division Management and for the PM to facilitate a resolution with the team,

management, and sponsor(s). The AE provided certification that the design have undergone the AE's quality control procedures and that the P&S are ready for advertising. It is also noted that the AE is required to have all the design drawings stamped by a registered PE, with a caveat that the geotechnical engineering was completed by SPK. In addition, once the issues raised by the ATR team have been addressed by the PDT, to the ATR team's satisfaction, then the ATR Team Lead and SPK's PM will sign the "Completion of Quality Assurance Review and Agency Technical Review". Once this occurs the PDT concurs with the project design and that the P&S are ready for advertising.

**10. POINTS OF CONTACT.** Questions about this Review Plan may be directed to SPK's Engineering Lead Diana Modini at (916) 557-6821 or the Project Manager Mark Ellis at (916) 557-6892. The Engineering Division Chief is Kevin Knuuti at (916) 557-7623. The following are additional points of contacts.

#### VERTICAL TEAM POC's

Karen Berresford	District Support Team Mgr & MSC approval authority for Decision Document RP's	CESPD-PDC	415-503-6557	<a href="mailto:Karen.G.Berresford@usace.army.mil">Karen.G.Berresford@usace.army.mil</a>
Andy Constantaras	Regional Business Directorate. MSC approval authority for Implementation Document RP's	CESPD-RB	415-503-6510	<a href="mailto:Andrew.Constantaras.usace.army.mil">Andrew.Constantaras.usace.army.mil</a>
Clyde Okazaki	Chief, Business Technical Division ( RMO)	CESPD-RBT	415-503-6505	<a href="mailto:Clyde.y.Okazaki@us.army.mil">Clyde.y.Okazaki@us.army.mil</a>
Nathan Snorteland	Director, Risk Management Center (RMC)	CEIWR	571-232-9189	<a href="mailto:Nathan.J.Snorteland@usace.army.mil">Nathan.J.Snorteland@usace.army.mil</a>
Ada Benavides	SPD Regional Integration Team (RIT)	HQUSA CE	202-761-4085	<a href="mailto:Ada.Benavides@usace.army.mil">Ada.Benavides@usace.army.mil</a>

**11. REVIEW PLAN APPROVAL.** It is noted that approval authority for implementation document RP's is the MSC (SPD), Andy Constantaras. SPK requests that the SPD endorse the above recommendations and approve this Review Plan as described in Appendix B of EC 1165-2-609.

**APPENDIX A**  
**FORMS**

## MARYSVILLE RING LEVEE

### PHASE 1 DESIGN

#### COMPLETION OF DISTRICT QUALITY CONTROL

COMPLETION OF QUALITY CONTROL ACTIVITIES. The District has completed the geotechnical and hydraulic portion of the design plans and specifications for the Marysville Ring Levee, Phase 1. Certification is hereby given that all quality control activities, appropriate to the level of risk and complexity inherent in the project, associated with project development and District Quality Control (DQC), as defined in the Quality Control Plan and Review Plan (RP), have been completed.

GENERAL FINDINGS. Compliance with established policy, principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions; methods, procedures and materials used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and the reasonableness of the results, including whether the project meets the customer's needs consistent with law and existing Corps policy. Documentation of the quality control process is contained in the project file.

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QC Geotechnical Engineer, Mary Perlea

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Date

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QC Hydraulic Engineer, Mike Lin

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Date

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Technical Lead, Diana Modini

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Date

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Project Manager, Mark Ellis

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Date

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ED-GS Chief, Edward Ketchum

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Date

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ED-HD Chief, Greg Kukas

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Date

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ED-DB-B Chief, Rick Torbik

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Date

## MARYSVILLE RING LEVEE

### PHASE 1 DESIGN

#### CONTRACTOR STATEMENT OF QUALITY CONTROL

COMPLETION OF QUALITY CONTROL ACTIVITIES. HDR Engineering, Inc., has completed the Plans, Specifications and Estimate for Marysville Ring Levee Project, Marysville, CA. Notice is hereby given that all quality control activities, appropriate to the level of risk and complexity inherent in the project associated with Project Development and Independent Review (ITR), as defined in the Quality Control Plan, have been completed. 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 analysis; alternatives evaluated; the appropriateness of data used and level data obtained; and reasonableness of the results, including whether the project meets the customer's needs consistent with law and existing Corps policy. Additionally, all appropriate Quality Assurance review comments received in DrChecks from the USACE Sacramento District (SPK) and reviewed by this office have been incorporated into this product or satisfactory resolved; feedback on all comments has been provided to SPK reviews. Documentation of the quality control process is contained in the project file. Accordingly, the undersigned recommends certification of the quality control process for this project.

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ITRT Leader

Date

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Technical Lead

Date

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Project Manager

Date

CERTIFICATION OF QUALITY CONTROL. As noted above, all requirements have been met and any issues and concerns associated with the development and independent technical review of the project have been addressed. The project documents meet the Corp's policy established contractual quality standards and the level of quality defined in our approval Quality Control Plan for the project, and are suitable to forward to the Corps for Quality Assurance overview and Quality Control Certification/ Acceptance.

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Senior Vice President

Date

## MARYSVILLE RING LEVEE

### PHASE 1 DESIGN

#### STATEMENT OF TECHNICAL REVIEW

#### COMPLETION OF QUALITY ASSURANCE REVIEW AND AGENCY TECHNICAL REVIEW

The District has completed the Plans and Specifications of the Marysville Ring Levee element of the Yuba River Basin Project. Notice is hereby given that (1) a Quality Assurance review has been conducted as defined in the Quality Control/Assurance Plan and (2) 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 project's Quality Management 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 review also assessed the DQC documentation and made the determination that the DQC activities employed appear to be appropriate and effective. The agency technical review was accomplished by the Corps of Engineers. All comments resulting from DQC/QA and ATR have been resolved.

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Monica B. Greenwell  
LRL-ED-T-C ATR Lead

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Date

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Mark A. Ellis  
PM-C Project Manager

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Date

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Rick A. Torbik  
Chief, Civil Engineering Design Section B

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Date

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Rick L. Poeppelman  
Chief, Design Branch

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Date

**MARYSVILLE RING LEVEE**

**PHASE 1 DESIGN**

**BCOE CERTIFICATION**

**Project Title:** Marysville Ring Levee, Phase 1

**Specification Number:** 1756

**Installation:** Yuba River Basin, CA

I certify that all appropriate Biddability, Constructability, Operability and Environmental comments received and reviewed by the office on \_\_\_\_\_ have been incorporated into the bid package. Feedback has been provided to reviews for all comments.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Drew A. Perry

Chief, Construction Quality Assurance Section

Construction-Operations Division

I certify that all appropriate Biddability, Constructability, Operability and Environmental comments received and reviewed by the office on \_\_\_\_\_ have been incorporated into the bid package. Feedback has been provided to reviews for all comments.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Norbert F. Suter

Chief, Construction Branch

Construction-Operations Division



**US Army Corps of Engineers  
Sacramento District  
DISTRICT ENGINEER'S QUALITY CONTROL CERTIFICATION**

**COMPLETION OF QUALITY CONTROL ACTIVITIES**

The District has completed the plans and specifications for Marysville Ring Levee, Phase 1. Certification is hereby given that all quality control activities associated with Project Development and Agency Technical Review (ATR), as defined in the Quality Control Plan, appropriate to the level of risk and complexity inherent in the project have been completed. Documentation of the quality control process is contained in the project file.

**GENERAL FINDINGS and RECOMMENDATION**

Compliance with clearly established policy, principles and procedures, utilizing clearly justified and valid assumptions, has been verified. This includes assumptions; methods, procedures and materials used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and the reasonableness of the results, including whether the project meets the customer's needs consistent with law and existing Corps policy. All appropriate ATR and Biddability, Constructability, Operability and Environmental (BCOE) review comments have been incorporated into this project. Accordingly, the undersigned recommends certification of the quality control process for this project.

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KEVIN KNUUTI, P.E.  
Chief, Engineering Division

Date

**QUALITY CONTROL CERTIFICATION**

As noted above, all requirements have been met and any issues and concerns associated with the development and Agency Technical Review of the project have been resolved. The project may proceed to construction.

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THOMAS C. CHAPMAN  
COL, EN  
Commanding

Date

## **APPENDIX B**

### **ACRONYMS**

AFB – Alternatives Formulation Briefing  
ATR - Agency Technical Review  
CAP – Continuing Authorities Program  
DCW – Director of Civil Works  
DQC - District Quality Control  
DX - Directory of Expertise  
EC – Engineering Circular  
EIS – Environmental Impact Statement  
ER – Engineering Regulation  
FACA – Federal Advisory Committee Act  
FCSA – Feasibility Cost Sharing Agreement  
FOIA – Freedom of Information Act  
FY – Fiscal Year  
HQUSACE – Headquarters, U. S. Army Corps of Engineers  
IEPR – Independent External Peer Review  
NED – National Economic Development  
NER – National Ecosystem Restoration  
MSC – Major Subordinate Command  
NAS – National Academy of Sciences  
NEPA –National Environmental Protection Act  
OEO – Outside Eligible Organization  
OMB – Office of Management and Budget  
OMRRR – Operations, Maintenance, Repair, Replacement and Rehabilitation  
PCX – Planning Center of Expertise  
PDT – Project Development Team  
PMP – Project Management Plan  
QA/QC – Quality Assurance / Quality Control  
QM – Quality Manual, the document specifying the QMS of an organization.  
QMP –Quality Management Plan  
QMS – Quality Management System  
RIT – Regional Integration Team (HQUSACE)  
RP – Review Plan  
RMC – Risk Management Center  
RMO – Review Management Organization  
RTS – Regional Technical Specialist  
SAR – Safety Assurance Review  
SME – Subject Matter Expert  
SPD – U.S. Army Corps of Engineers, San Francisco Division  
SPK – U.S. Army Corps of Engineers, Sacramento District  
USACE – U. S. Army Corps of Engineers  
USC – United States Code  
WRDA – Water Resources Development Act