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

REPLY TO
ATTENTION OF

8 JAN 2018

CESPD-DE

MEMORANDUM FOR Commander, Sacramento District, ATTN: CESPK-ED, Mr. Juan Gonzalez

SUBJECT: River Islands at Lathrop Phase 2B Project Alteration Specific Review Plan and Safety Assurance Review Plan and Approval for a Flood Risk Reduction Project Alteration under 33 U.S.C. 408 is approved.

1. References:

a. Memorandum, CESPK-ED, 14 December 2017, subject: River Islands at Lathrop Phase 2B Project– Request for Approval of the Alteration Specific Review Plan and Safety Assurance Review Plan (Enclosure 1).

b. Engineering Circular 1165-2-214, dated 15 December 2012, Civil Works Review.

c. Engineering Circular (EC) 1165-2-216, dated 30 September 2015, Policy and Procedural Guidance for Processing Requests to Alter U.S. Army Corps of Engineers Civil works Projects Pursuant to 33 U.S.C. 408.

2. A Safety Assurance Review (SAR) is mandated by Section 2035 of the Water Resources Development Act (WRDA) of 2007, implemented through guidance EC 1165-2-214 (reference 1.b.), and required for 33 U.S.C. Section 408 approval (Reference 1.c.). The South Pacific Division Sacramento District Support Team reviewed the River Islands at Lathrop Phase 2B Project Alteration Specific Review Plan and the Safety Assurance Review Plan submittal and the Sacramento District Chief of Engineering's recommendation. The enclosed Plans dated 14 December 2017 are found to be sufficient and are hereby approved.

3. The point of contact for this memorandum is Jessica Burton Evans, District Support Team Lead, Jessica.L.BurtonEvans@usace.army.mil.

Encl
1. 14 Dec 17 Memorandum

D. PETER HELMLINGER, P.E.
Brigadier General, USA
Commanding

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814-2922

REPLY TO
ATTENTION OF

CESPK-ED

MEMORANDUM FOR Commander, South Pacific Division, ATTN: CESPD-PD-C (Karen Berresford), 1455 Market Street, San Francisco, CA 94103-1398

SUBJECT: River Islands at Lathrop Phase 2B Project - Request for Approval of the Alteration Specific Review Plan and Safety Assurance Review Plan

1. In accordance with EC 1165-2-216, Section 7.c.(4), District-Led Agency Technical Review (ATR) and Section 2035 of the Water Resources Development Act (WRDA) of 2007, this memorandum formally transmits Sacramento District's Alteration Specific Review Plan (Encl 1) and Non-Federal Sponsor's Safety Assurance Review (SAR) Plan (Encl 2) for the River Islands at Lathrop Phase 2B Project for your review and approval.

2. The Sacramento District has reviewed the Non-Federal Sponsors' SAR panel members and found that they meet the criteria for independence and qualifications (Encl 3) per EC 1165-2-214 and the National Academy of Sciences' *Policy on Committee Composition and Balance and Conflicts of Interest* (2003). The District has also reviewed the SAR Plan (Encl 2) and found it to meet the intent of Section 2035 of WRDA 2007.

3. The point of contact is Juan Gonzalez. He can be reached at 916-557-7936.

FOR THE COMMANDER:

RICK L. POEPPELMAN, P.E.
Chief, Engineering Division
Levee Safety Officer

3 Encls
1. Alteration Specific Review Plan
2. Safety Assurance Review Plan
3. District Statement of Independence and Qualification

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
RISK MANAGEMENT CENTER
12596 WEST BAYAUD AVE., SUITE 400
LAKEWOOD, CO 80228

REPLY TO
ATTENTION OF

CEIWR-RMC

25 May 2017

MEMORANDUM FOR: Commander, Sacramento District, ATTN: CESPK-CO-OR

SUBJECT: Risk Management Center Endorsement, River Islands at Lathrop, Phase 2B Project, San Joaquin River and Tributaries Project, 408 Request, Review Plan

1. The Risk Management Center (RMC) has reviewed the Review Plan (RP) for – , River Islands at Lathrop, Phase 2B Project, San Joaquin River and Tributaries Project, 408 Request, dated 1 May 2017, and concurs that this RP complies with the current peer review policy requirements outlined in EC 1165-2-214 “Civil Works Review Policy” and EC 1165-2-216, “Policy and Procedural Guidance for Processing Requests to Alter US Army Corps of Engineers Civil Works Projects Pursuant to 33 USC 408”, dated 15 December, 2012 and 31 July 2014 respectively.

2. This review plan was prepared by Sacramento District and the requestor, reviewed by the RMC, and all of RMC’s review comments have been satisfactorily resolved. For this project a Type II IEPR will be performed.

3. The RMC endorses this document to be approved by the MSC Commander. Upon approval of the RP, please provide a copy of the approved RP, a copy of the MSC Commander’s approval memorandum to the RMC Senior Review Manager (rmc.review@usace.army.mil).

4. Thank you for the opportunity to assist in the preparation of this RP. Please coordinate all aspects of the Agency Technical Review and the Independent External Peer Review (as appropriate) efforts defined in the RP. For further information, please contact me at 601-631-5896

Sincerely,

HERR.DUSTIN.CHARLES.1384614082
Digitally signed by HERR.DUSTIN.CHARLES.1384614082
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=HERR.DUSTIN.CHARLES.1384614082
Date: 2017.05.25 07:57:39 -05'00'

Dustin C. Herr, P.E.
Review Manager
Risk Management Center

CF:
CEIWR-RMC (Mr. Snorteland)
CESPF-DQM (Division Quality Manager)

U.S. Army Corps of Engineers
South Pacific Division
Sacramento District

Review Plan for *River Islands at Lathrop, Phase 2B Project, San Joaquin River and Tributaries Project* Pursuant to 33 USC § 408

THE INFORMATION CONTAINED IN THIS REVIEW PLAN IS DISTRIBUTED SOLELY FOR THE PURPOSE OF PREDISSEMINATION PEER REVIEW UNDER APPLICABLE INFORMATION QUALITY GUIDELINES. IT HAS NOT BEEN FORMALLY DISSEMINATED BY THE U.S. ARMY CORPS OF ENGINEERS. IT DOES NOT REPRESENT AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY.

ENDORSED BY:

HERR.DUSTIN.CHARLES.1384614082

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Date: 2017.05.25 07:33:50 -05'00'

5/25/17

Dustin Herr, P.E
USACE, Risk Management Center

DATE

APPROVED BY:

8 JAN 18

BG Peter D. Helmlinger, P.E.
Commanding

DATE

US Army Corps of Engineers

Contents

1. Introduction

a. Purpose of This Review Plan

This Alteration-Specific Review Plan is intended to ensure quality of the review by the Sacramento District for the request to alter a U.S. Army Corps of Engineers (USACE) civil works project within the Sacramento District's area of responsibility. This review plan was prepared in accordance with Engineer Circular (EC) 1165-2-216, Policy and Procedural Guidance for Processing Requests to Alter U.S. Army Corps of Engineers Civil Works Projects Pursuant to 33 USC 408 (reference paragraph 7.c.(4) in EC 1165-2-216) and Engineering Circular (EC) 1165-2-214, Civil Works Review Policy. This review plan provides the review guidelines associated with a specific alteration request pursuant to 33 USC 408 (Section 408).

b. Guidance and Policy References

- EC 1165-2-214, Civil Works Review Policy, 15 December 2012
- EC 1165-2-216, Policy and Procedural Guidance for Processing Requests to Alter U.S. Army Corps of Engineers Civil Works Projects Pursuant to 33 USC 408, 30 September 2015
- ER 1110-1-12, Quality Management, 31 Mar 2011
- ER 1110-1-1807, Drilling in Earth Embankment Dams and Levees, 31 December 2014
- EM 1110-2-1913 Design, Construction, and Evaluation of Levees, 30 April 2000

The products applicable to determination of impacts to the operation and maintenance of the flood risk reduction project will be reviewed against published guidance, including Engineering Regulations, Engineering Circulars, Engineering Manuals, Engineering Technical Letters, Engineering Construction Bulletins, Policy Guidance Letters, implementation guidance, project guidance memoranda and other formal guidance memoranda issued by HQUSACE.

c. Description and Information

This Review Plan covers the River Islands at Lathrop Phase 2B Project. The River Islands at Lathrop Phase 2B Project would alter the San Joaquin River and Tributaries Project, a federally authorized flood risk reduction project. The purpose of the River Islands at Lathrop project is to construct a large-scale, mixed-use project consisting of residential development and a commercial complex, which may include open space and recreational amenities, in San Joaquin County or the south Sacramento–San Joaquin River Delta (Delta) area. The Phase 2B alterations include the reconstruction and

expansion of approximately 5.6 miles of the existing Old River levee; construction of two extended (i.e., overwidened) setback levees along Paradise Cut and breaching of the existing levee; and improvements to flood conveyance in Paradise Cut through removal of flow constriction at existing Paradise Weir (see Figure 2).

River Islands at Lathrop, herein referred to as River Islands, is a master-planned community on Stewart Tract in the Sacramento-San Joaquin Secondary Delta in the City of Lathrop. Stewart Tract is bounded by the San Joaquin River on the east, Old River on the north, and Paradise Cut on the southwest (see Figure 1). The proposed alteration would achieve flood risk reduction from the 200-year event and bring the flood management system in the project area into compliance with applicable engineering, design, operation, and maintenance standards established by the Federal Emergency Management Agency, the California Department of Water Resources (DWR), and USACE.

The specific alterations include:

Old River Left Bank Levee - Under the proposed action, the existing 2% (50-year) project levee along Old River would be reconstructed and widened. The levee would initially be reconstructed with a crown width between 65 and 75 feet and height adequate to provide the level of performance needed for a 0.5% AEP (200-year) flood event plus 3 feet. The levees would be progressively widened by placing engineered fill on the landside slope of the levee to a finished crown width of 300 feet. The new levee would serve the same flood risk reduction function as a traditional levee, but its cross section would be wide enough to accommodate placement of structures on the landside of the levee outside the theoretical prism and access road. The Old River levee will be sufficiently wide to allow planting benches to be graded into the existing riverbank to allow for habitat plantings.

Paradise Cut Right Bank Levee – A new setback levee would be constructed along Paradise Cut. The setback levee would include widened embankments similar to the alterations described above for the Old River Left Bank Levee. Once the new levee is in place, the existing Federal levee would be breached in several places and remain in place. Remnants of the former levee would be revegetated to provide emergent/upland habitat for riparian brush rabbits. The overall effects of constructing the new setback levee and breaching the existing levee would result in a widened floodway which, in turn, would contribute towards reestablishing the design flow split between Paradise Cut and the San Joaquin River.

Cross Levee – The proposed action also includes completion of a non-Federal cross levee immediately northwest of and parallel to the existing embankment that supports the UPRR tracks. The cross levee would be built to a design condition to resist a 0.5% (200-year) flood level plus 3 feet of freeboard, although it would be designed as a standard levee, not widened levee. While this levee work is not subject to Section 408 permission, its connection to the Federal Paradise Cut levee will be designed and constructed to ensure no adverse effect to the San Joaquin River and Tributaries Project.

Paradise Weir - The existing Paradise Weir near the San Joaquin River diversion would remain in place at its current width and elevation. The proposed action would include removal of downstream sediment. Approximately 4 to 5 vertical feet of material would be removed from the existing 40-acre terrace bench across this area.

d. Review Management Organization (RMO) Coordination

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for the peer review effort described in this Review Plan is the USACE Risk Management Center (RMC).

As the RMO for the Type II IEPR, the Risk Management Center (RMC) will determine if the proposed alteration is to be presented to the Levee Senior Oversight Group (LSOG). Determination of whether or not a LSOG review is required is based on whether the benefits of the alteration are generally commensurate with the risks, whether the alteration potentially worsens or creates new failure modes or risk drivers for the USACE project, and whether the alteration is exceptionally complex or high risk. The RMC has recommended this Section 408 alteration be briefed to the LSOG.

2. Execution Plan and Review Requirements

a. Level of Review Required by the District

The review of this alteration request shall include a district-led Agency Technical Review (ATR), reference paragraph 7.c.(4) in EC 1165-2-216. Per EC 1165-2-214 the District's Chief of Engineering has determined that a Type II Independent External Peer Review (Safety Assurance Review (SAR)) will be required.

Drilling Program Plans must be reviewed and approved by the Sacramento District Levee Safety Officer. If any drilling fluid or other stabilizing or circulating media is proposed, a technical review performed by the Geotechnical and Materials Community of Practice (G&M CoP) Standing Committee on Drilling and Instrumentation is required.

The plan will then require approval from the District LSO pending satisfactory resolution of the technical review comments, see ER 1110-1-1807.

b. Level of Review Required by the Requester

(1) **Quality Assurance and Quality Control (QA/QC) Review**. QA/QC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Quality Control Plan (QCP) of the requester see Attachment 4. QC will consist of Quality Checks and reviews as outlined in the QCP. QA/QC reviews will be accomplished by the requester. The requester should provide USACE with documentation regarding the quality control/quality assurance procedures followed in the development of the project design. This documentation should be in the form of a report that identifies:

i. Purpose and scope of the review.
ii. Description of the review team and a short statement on their qualifications.
iii. Summary of the review performed during design.
iv. Lessons learned and major changes made during the review.
v. All internal QC comments and resolutions.
vi. Supplemental studies or analyses performed during the design, e.g. geotechnical report.

(2) **Safety Assurance Review (SAR**) A Safety Assurance Review, also known as a Type II IEPR, shall be conducted on design and construction activities for flood risk management projects, as well as, other projects where potential hazards pose a significant threat to human life. A SAR was determined to be required by SPK due to the proposed project consisting of setback levees. The proposed alteration requires a Type II IEPR due to potential hazards posing a significant threat to public safety. External panels will review the design and construction activities prior to initiation of physical construction and periodically thereafter until construction activities are completed. The requestor will prepare and follow the approved SAR plan. The charges to the SAR panels complement the ATR process and do not duplicate it. The SAR will be accomplished by the requestor. For a SAR, the selection of the review panel members will use the National Academy of Science (NAS) Policy which sets the standard for “independence” in the review process. The Requester’s Design of Record AE CANNOT procure the experts.

c. District Review Purpose

The review of all work products will be in accordance with the guidelines established within this review plan. The ATR will serve as the districts review of the request. The purpose of this review is to ensure the proper application of established criteria, regulations, laws, codes, principles and professional practices.

For the purposes of Section 408, the ATR team will make the following determinations:

1) Impair the Usefulness of the Project Determination. The objective of this determination is to ensure that the proposed alteration will not limit the ability of the project to function as authorized and will not compromise or change any authorized project conditions, purposes or outputs.

2) Injurious to the Public Interest Determination. Proposed alterations will be reviewed to determine the probable impacts, including cumulative impacts, on the public interest. The decision whether to approve an alteration will be determined by the consideration of whether benefits are commensurate with risks.

3) Legal and Policy Compliance Determination. A determination will be made as to whether the proposed alteration meets all legal and policy requirements.

4) Verify Appropriate Decision Level. Verify whether or not HQUSACE or SPD review and decision is required.

e. Decision-Level Determination

Per Memorandum dated November 10, 2016, and titled Interim Guidance on Section 408 Decision Level, the following questions must be addressed to determine required review and decision level. If the answer to any of the following questions is “yes”, and the District and Division recommend approval of the alterations, then the Section 408 request requires HQUSACE level review and decision.

i. Does the proposed alteration change how the USACE project will meet its authorized purpose? An example would be a proposed alteration to permanently breach a levee system for ecosystem restoration purposes but raise all structures behind the levee to achieve the same flood risk management benefits. This project still meets the authorized flood risk management purpose, but in a different manner. No

ii. Does the proposed alteration preclude or negatively impact alternatives for a current General Investigation (GI) or other USACE study? No

iii. Is the proposed alteration for installation of hydropower facilities? No

iv. Is there a desire for USACE to assume operations and maintenance responsibilities of the proposed navigation alternation pursuant to Section 204(f) of Water Resources Development Act (WRDA) of 1986? No

Therefore HQUSACE review and decision will not be required.

If the answer to any of the following questions is “yes”, and the District recommends approval of the alterations, then the Section 408 request requires SPD level review and decision.

i. Does the proposed alteration require a Type II IEPR, reference EC 1165-2-214? Yes
ii. Is the non-federal sponsor for a USACE project seeking potential credit under Section 221(a)(4) of the Flood Control Act of 1970, as amended? A decision on a Section 408 request is separate from any decision on potential credit for in-kind contributions. Reference ER 1165-2-208 for requirements regarding credit for in-kind contributions. No
iii. Can the proposed alteration be approved by the District Commander, but the Division Commander established a regional process that requires certain district Section 408 decisions to be made by that Division Commander? No

Therefore, SPD review and decision will be required.

3. District-Led Agency Technical Review Team

The District-led Agency Technical Review Team is comprised of reviewers with the appropriate independence and expertise to conduct a comprehensive review in a manner commensurate with the type of proposed alteration described in Section 1.b of this review plan.

The Sacramento District ATR team expertise required for this review plan are listed below:

ATR Lead: The ATR team lead is a senior professional with extensive experience in reviewing Section 408 alteration requests and conducting ATRs. The ATR lead has the necessary skills and experience to lead a team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline.

Hydrologic and Hydraulics Engineering: The Hydraulics Engineering Reviewer is charged with reviewing the Hydrologic and Hydraulics System Performance Analysis to determine the potential hydrologic and hydraulics impacts of the proposed alterations. In addition, to review all decision documents.

The reviewer should be experienced with the use of HEC-RAS 4.0 (River Analysis System), the HEC Statistical Software Package (SSP). It is used to compute peak flow frequency curve statistics (mean, standard deviation, and skew). The reviewer should be familiar with the computation of frequency curves using conditional probability methods and development of hydrographs. The reviewer should be an expert in the field

of urban hydrology and hydraulics, have a thorough understanding of the dynamics of both open channel flow systems, enclosed systems, application of detention/retention basins, effects of best management practices and low impact development on hydrology, approaches that can benefit water quality, application of levees and flood walls in and urban environment with space constraints, non-structural measures especially as related to multipurpose alternatives including ecosystem restoration, non-structural solutions involving flood warning systems, and non-structural alternatives related to flood proofing. The team member will have an understanding of computer modeling techniques that will be used for this project. The reviewer should also be experienced in FLO-2D, a flood routing model that simulates channel flow, unconfined overland flow and street flow over complex topography.

Geotechnical Engineering: The Geotechnical Engineering Reviewer is charged with reviewing the complete plans and specifications and the Basis of Design Report, and other supporting technical analysis.

The Geotechnical Engineering reviewer should be a senior geotechnical engineer with experience in levees and floodwalls as well as implementation documents for projects. The lead reviewer should be familiar with deterministic seepage and stability analyses performed for various water surface elevations, including top of levee, on index points determined by the PDT. In addition, must be familiar with the under seepage analysis using theory analysis as described in ETL 1110-2-256, EM 1110-2-1913, and TM 3 – 424.

Environmental Planning/Regulatory: The Environmental Planning Reviewer is charged with reviewing the Biological Assessment, Environmental Impact Statement, and other supporting technical analysis.

Counsel: The Legal Reviewer is charged with reviewing all documents prepared in compliance with the National Environmental Policy Act (Environmental Impact Statement and Record of Decision or Environmental Assessment and Finding of No Significant Impact), including all supporting technical and environmental analyses deemed necessary. In addition, the Legal Reviewer will review all decision documents, including but not limited to the Project Summary Report.

Real Estate: The Real Estate Reviewer is charged with reviewing the Project Summary Report, design documents and other supporting technical analysis deemed required.

a. Review Procedures

Reviews will be conducted in a fashion which promotes dialogue regarding the quality and adequacy of the required documentation. The ATR team will review the documents provided.

The four key parts of a review comment will normally include:

1) The review concern – identify the 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 been properly followed.

3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the district's ability to make a decision as to whether to approve or deny the Section 408 request.

4) The probable specific action needed to resolve the concern – identify the action(s) that the requester 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 must include the text of each ATR concern, a brief summary of the pertinent points in any discussion, including any vertical coordination, 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 with a notation that the concern has been elevated to the vertical team for resolution.

Reviews will be initiated by the ATR Lead by distributing project documents to the ATR Team. All comments and responses may be documented in a response matrix in lieu of DrChecks.

The ATR may be certified when all ATR comments are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The final ATR certificate will be signed by the Engineering Division Chief.

Once District ATR has been completed and a demonstration of environmental compliance provided, the District will develop a Summary of Findings package to serve as the basis for the final recommendation on the proposed alteration. This package will include:

1) Summary of rationale and conclusions for recommending approval or denial;

2) Written request;

3) A physical and functional description of the existing project, including a map;

4) Project history and authorization;

5) Impact to the usefulness of the USACE project determination;

6) Injurious to the public interest determination;

7) Policy Compliance certification;

8) Certification of Legal Sufficiency from District Office of Counsel;

9) Certification by the Chief of the District Real Estate Division that the real estate documentation is adequate;

10) Summary of any changes to the O&M manual;

11) Applicable environmental compliance documentation including, but not limited to NEPA documentation, Endangered Species Act (ESA) documentation, and other necessary documentation.

12) Draft Record of Decision (ROD);

13) Any additional final conclusions or information, including any associated controversial issues.

The Summary of Findings package will then be submitted to South Pacific Division (SPD) through the District Support Team to be reviewed for a total of 30 days, unless SPD notifies SPK that additional review time is needed. SPK will be responsible for addressing SPD's comments. SPD will then either approve or deny the 33 USC 408 Request. SPD will then provide the decision document to the Sacramento District.

Sacramento District is responsible for providing a written notification of the outcome for all Section 408 requests.

Post-permission oversight will be coordinated to ensure that the project is constructed in accordance with the approved plans, specifications, and in accordance with the 408 permission. Post-permission oversight will be provided by Engineering Division and Construction-Operations Division. The District will provide construction oversight that is commensurate to the complexity and type of construction activities.

b. Products to Undergo ATR

The following products will undergo ATR:

1) Environmental Impact Statement
2) Biological Assessment(s) and other technical memoranda (e.g., cultural resources reports)

3) Plans and Specifications
4) Design Memoranda and Reports (e.g., hydraulic impact report; drilling program plan; geotechnical basis of design)
5) Project Summary Report
6) As-built drawings
7) Updated Supplement to the Operations and Maintenance Manual
8) Other Section 408 documents requested as needed by the Sacramento District

c. Completion and Certification of the ATR

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:

(1) Identify the document(s) reviewed and the purpose of the review;

(2) Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;

(3) Include the charge to the reviewers;

(4) Describe the nature of their review and their findings and conclusions;

(5) Identify and summarize each unresolved issue (if any); and

(6) 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 completion of ATR and Certification of ATR. It will certify that the issues raised by the ATR team have been resolved (or elevated to the vertical team). The completion and certification should be completed based on the work reviewed to date for the project. A Sample Completion of ATR and Certification of ATR are included in Attachment 1.

The ATR team members will determine whether the proposed alteration would impair the usefulness of the federal project, be injurious to the public interest, or meets legal and policy requirements. ATR team members will provide their comments to the District Section 408 Coordinator, who will use the comments to determine if the proposed alteration can be approved in accordance with EC 1165-2-216. Conflicts in addressing ATR comments will be elevated to the functional chief and SPD for resolution if

necessary. Following ATR, the District Section 408 Coordinator will compile a Summary of Findings in accordance with Step 5 from EC 1165-2-216 (with an appendix of ATR Comments and Resolution) and obtain the endorsement of the District Levee Safety Program Manager, the District Levee Safety Officer, the District Counsel, and other District leadership before recommending to the District Commander that the proposed alteration be approved or denied.

4. Requester-Led SAR

a. Required SAR Panel Expertise

The following provides an estimate of the SAR panel members and the types of expertise that should be represented on the review panel. All panel members shall be "distinguished experts in engineering, hydrology, or other appropriate disciplines". Panel members should have an advanced degree and be professionally registered.

For this specific alteration, the SAR Panel expertise should include:

(1) Geotechnical Engineer – with the following:

- Expertise in model parameters and interpreting results from seepage and slope stability models;
- Seismic vulnerability of levees in San Joaquin River system;
- Experience in levee construction, including phasing, as it relates to setback levees;
- Knowledge and understanding of the San Joaquin River system;
- Knowledge of recent, ongoing, and future flood risk reduction projects in the Central Valley;
- Knowledge of levee design, specifically, expertise and/or experience with standards based on USACE, FEMA, and State of California design criteria.

(2) Hydraulic Engineer – with the following:

- Expertise in 1D and 2D HEC-RAS modeling;
- In-depth knowledge of the Central Valley Hydrology Study;
- Erosion and scour principles;
- Knowledge and understanding of the San Joaquin River system;
- Knowledge of recent, ongoing, and future flood risk reduction projects in the Central Valley;
- Knowledge of levee design, specifically, expertise and/or experience with standards based on USACE, FEMA, and State of California design criteria.

b. Completion and Certification of the IEPR

Comments should address the adequacy, appropriateness and acceptability of the design and construction activities for the purpose of assuring good science, sound engineering, and public health, safety, and welfare are the most important factors that determine a project's fate. SAR comments should generally include the same four key parts as described for ATR comments in Section 3a. For each milestone, the SAR panel will prepare a Review Report:

A suggested report outline is an introduction, the composition of the review team, a summary of the review during design, a summary of the review during construction, any lessons learned in both the process and/or design and construction, and appendices for conflict of disclosure forms, for comments to include any appendices for supporting analyses and assessments of the adequacy and acceptability of the methods, models, and analyses used. All comments in the report will be finalized by the panel prior to their release to USACE for each review plan milestone. Written responses to the IEPR Review Report will be prepared to explain the agreement or disagreement with the views expressed in the report, the actions undertaken or to be undertaken in response to the report, and the reasons those actions are believed to satisfy the key concerns stated in the report (if applicable).

5. Review Schedule and Cost

a. Schedule

To the extent practical, reviews should not extend the design schedule but should be embedded in the design process. Reviewers should be involved at key decision points and are encouraged to provide timely over the shoulder comments. Provide an overall review schedule that shows timing and sequence of all reviews.

PROJECT PHASE/SUBMITTAL	REVIEW START DATE	REVIEW END DATE
DQC Review (65%)	March 13, 2018	April 7, 2018
ATR Review	April 14, 2018	June 14, 2018
IEPR for design	April 14, 2018	July 13, 2018
IEPR for construction	TBD	TBD

b. Cost

The estimated cost for the ATR is approximately $90,000. The environmental and cultural leads are from Regulatory Division, thus those costs are funded separately.

DISCIPLINE	ESTIMATED COST
ATR Lead / Operations Representative	$15,000
Geotechnical Engineer/ LSPM	$35,000
Hydrology and Hydraulics	$35,000
Real Estate	$5,000

6. Public Participation of Review Plan

As required by EC 1165-2-214, the approved Review Plan will be posted on the District public website (http://www.spk.usace.army.mil/Media/USACE-Project-Public-Notices/). 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 will 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.

7. Review Plan Points of Contact

Name/Title	Organization	Email/Phone
Ryan Larson District Section 408 Coordinator	CESPK-CO-OR	Ryan.T.Larson2@usace.army.mil 916-557-7568
Project Manager /ATR Lead	CESPK-CO-OR	Juan.M.Gonzalez@usace.army.mil 916-557-7936
RMC Review Manager	CEIWR-RMC	rmc.review@usace.army.mil 304-399-5217

ATTACHMENT 1: COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the River Islands at Lathrop, Phase 2B Project to alter the San Joaquin River and Tributaries Project. The ATR was conducted as defined in the Alteration-Specific Review Plan to comply with the requirements of EC 1165-2-216. During the ATR, compliance with established policy principles and procedures and legal requirements was verified. This included the determination whether the proposed alteration would impair the usefulness of the federal project or was injurious to the public interest. All comments resulting from the ATR have been resolved.

Juan Gonzalez ATR Team Leader CESPK-CO-OR	Date
Ryan Larson District Section 408 Coordinator CESPK-CO-OR	Date
Nate Snorteland Director CEIWR-RMC	Date

CERTIFICATION OF AGENCY TECHNICAL REVIEW

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

Rick Poeppelman Chief, Engineering Division Levee Safety Officer CESPK-ED	Date

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ATTACHMENT 2: DISTRICT TEAM ROSTERS

Agency Technical Review (ATR) Team

DISCIPLINE	NAME	DESCRIPTION OF CREDENTIALS
ATR Lead / Operation Representative	Juan Gonzalez	Mr. Gonzalez has 12 years of professional experience as a civil engineer. He worked 5 years for a private geotechnical engineering consulting firm before joining the Sacramento District, U.S. Army Corps of Engineers in March of 2010. His experience at USACE includes diverse projects and programs - most notably the Levee Periodic Inspection Program, the Levee Screening Risk Assessments, geotechnical analysis in support of civil works projects, and the processing of 408 permit applications. He has worked extensively with flood control agencies and USACE PDTs in the capacity of an Operations representative for the development of operations and maintenance manuals, and has provided guidance for the proper design of flood damage risk reduction projects to ensure projects are able to be maintained post-construction. Mr. Gonzalez earned a Bachelor's of Science Degree in Civil Engineering from Sacramento State University in 2005 and is a registered professional Civil Engineer in the State of California.
Geotechnical Engineer / Levee Safety Program Manager	Erik James	Mr. James has more than 11 years of professional engineering experience, and has been with the Geotechnical Engineering Branch at the Sacramento District since 2008, first in the Soil Design Section, and then in the newly formed Levee Safety Section. He is currently the Chief of Soil Design Section B. Erik has a strong understanding of flood risk management feasibility studies and levee safety program aspects, and has been teaching Geotechnical risk based analysis at HEC Davis for the last four years. His past projects

		as the lead Geotechnical Engineer include Yuba Basin (Marysville), Sutter Basin, and Lower Cache Creek. Erik serves on the Deep Foundations Institute - Soil Mixing Committee, and he is the author of the deep mixing chapter of the forthcoming Engineer Manual Seepage Barrier Cutoffs. Erik has consulted on soil mixing for seepage cutoff barriers for levee and dam projects nationwide. Erik holds a Bachelor's Degree in Geology from UC Davis, and a Bachelor's Degree in Civil Engineering from Sac State. He is a Professional Civil Engineer, a Professional Geotechnical Engineer and a Professional Geologist in the State of California; and a USACE Contracting Officer Representative and a DAIWA Level 2 Certified Facilities Engineering Acquisition Professional.
Hydrology and Hydraulics	Ethan Thompson	Mr. Thompson has 17 years of technical experience of water resource related engineering projects primarily related to flood damage reduction projects including levees and dams. His experience in hydraulic design and analysis includes FEMA floodplain mapping, channel capacity improvements, development of design water surface profiles, erosion analyses, wind-wave analyses, risk and uncertainty analyses, and hydraulic structure analysis and design (culverts and spillways). He has performed hydrologic and hydraulic modeling using one-dimensional and multi-dimensional computer models including use of HEC-RAS, UNET, FLO-2D, and FDA. He is also experienced in use of physical modeling for design and operation of spillways. He is a professional engineer in the State of California and holds a Bachelors and Master's Degree (Water Resources emphasis) in Civil Engineering from Brigham Young University.
Real Estate	Elizabeth Youn	Elizabeth Youn is a senior realty specialist at the Sacramento District; she is directing all Management and Disposal activities of the Sacramento and San Francisco District. Elizabeth has been the technical advisor for numerous flood reduction and environmental restoration studies

		and has 18 years of experience supporting Water Resources Development Act programs. Elizabeth holds a Bachelor's degree in liberal arts from Albion College.
Office of Counsel	Lisa Clay	Lisa H. Clay is a member of the Wisconsin State Bar. She graduated from University of Wisconsin School of Law with a Juris Doctor degree in May 1987. In 1984, she received a Bachelor of Arts degree from Spelman College with a major in Psychology and a minor in Mathematics. Ms. Clay has served in her position as Assistant District Counsel in the Sacramento District since November 1987. Ms. Clay is the senior environmental law attorney in the Sacramento District and is the primary legal advisor for the District's Regulatory Program. During her tenure in the District, Ms. Clay has actively supported various Corps missions. For example, in 2003, Ms. Clay was a founding member of the District's Family Support Group (FSG) which was formed soon after District team members began deploying to Iraq. Ms. Clay served as team leader of the FSG from March – September 2003. She received recognition for her service from the Division Commander. In 2010, Ms. Clay completed a 60-day assignment in the New Orleans District Office of Counsel to assist with their environmental and regulatory workload. Ms. Clay also supports regional programs and initiatives. Ms. Clay has been an active participant of the South Pacific Division Mitigation Banking Project Delivery Team. The Mitigation Banking PDT is charged with developing template mitigation banking documents for use in the three California Districts that will help streamline the review of Mitigation Bank documents in light of the 2008 Mitigation Rule issued jointly by the U.S. Environmental Protection Agency and the Corps.
Environmental Manager	Bill Guthrie	Mr. Guthrie is the Chief of the California Delta Branch, Sacramento District Corps of Engineers. He has worked for the Sacramento District Regulatory Division for 16 years. Mr. Guthrie has

		experience working on complicated, high profile regulatory permits, including those that require an EIS and endangered species consultation. Mr. Guthrie graduated from Sacramento State University with a degree in Conservation Biology.
Archeologist / Cultural Resource Specialist	Erin Hess	Ms. Hess has over 6 years of experience as the Cultural Resources Specialist for Regulatory Division in Sacramento District, ensuring compliance with the National Historic Preservation Act (NHPA) and conducting Native American consultation for projects located in California, Nevada, Utah, and Colorado. In this capacity, Ms. Hess has worked with a large number of Native American tribes as well as local and national historical organizations and has developed and executed a significant number of project-specific memorandum of agreements as well as Regulatory Program-specific programmatic agreements. She also works extensively with State Historic Preservation Officers, the Advisory Council on Historic Preservation, as well as other federal and state agencies. Ms. Hess is currently an instructor for the Regulatory IIA PROSPECT Training course, and has also developed and instructed multiple local and regional training courses in NHPA compliance. Ms. Hess has an additional 10 years of experience as a Regulatory Project Manager in both Sacramento and Alaska Districts, working on complicated Regulatory permit actions, enforcement actions, and jurisdictional determinations. Ms. Hess also completed a 4-month professional development detail to Regulatory Headquarters in Washington, DC, in 2012. Ms. Hess earned a Bachelor's of Science Degree in Geology, with a Minor in Anthropology, from the Mackay School of Mines, University of Nevada, Reno, in 2004. She has also completed additional graduate work in remote sensing and

		fluvial geomorphology at the University of Alaska, Fairbanks.
Construction Manager	Michelle Lockhart	Ms. Michelle Lockhart has over 8 years of professional experience as a civil engineer. Ms. Lockhart has worked at the Sacramento District since June 2009, where she has extensive experience in the construction of flood damage reduction projects, including the construction of levees, floodwalls, emergency levee repairs, and 408 projects. Ms. Lockhart earned a Bachelor of Science Degree in Civil Engineering in 2009 from California State University of Chico.

ATTACHMENT 3: SAR PLAN

River Islands at Lathrop Phase 2B Project Safety Assurance Review Plan

August 2016
Revised March 2017 per USACE RMC Comments

River Islands at Lathrop
73 Stewart Road
Lathrop, California 95330

The intent of this document is to satisfy the Safety Assurance Review (SAR) requirements for the River Islands at Lathrop, Phase 2B Project as required by Section 2035 of the Water Resource Development Act (WRDA) of 2007 and described in the U.S. Army Corps of Engineers' (USACE) Engineers Circular 1165-2-214, Civil Works Review Policy. This document outlines how the SAR will be performed and identifies a panel of independent, external peer reviewers who are charged with executing the SAR.

1.0 Project Location

The River Islands at Lathrop Phase 2B project is located on Stewart Tract in the Sacramento-San Joaquin Secondary Delta in the City of Lathrop. Stewart Tract is an island, bounded by the San Joaquin River on the east, Old River on the north, and Paradise Cut on the southwest. See Figure 1.

2.0 Project Description

River Islands is proposing to implement improvements to the flood management system protecting Stewart Tract. The proposed improvements would reduce flood risk and bring the flood management system in the project area into compliance with applicable engineering,

design, operation, and maintenance standards established by the Federal Emergency Management Agency, the California Department of Water Resources (DWR); and USACE.

The River Islands at Lathrop Phase 2B Project would alter the San Joaquin River and Tributaries Project, a federally authorized flood risk reduction project. The Phase 2B alterations include the reconstruction and expansion of approximately 5.6 miles of the existing Old River levee; construction of two extended (i.e., overwidened) setback levees along Paradise Cut and breaching of the existing levee; and improvements to flood conveyance in Paradise Cut through removal of flow constriction at existing Paradise Weir (Figure 2).

The specific alterations include:

Old River Left Bank Levee - Under the proposed action, the existing 2% (50-year) project levee along Old River would be reconstructed and widened. The Levee would initially be reconstructed with a crown width of 65-75 feet and height adequate to provide the level of performance needed for a 0.5% (200-year) flood event plus 3 feet. The levees would be progressively widened by placing engineered fill on the landside slope of the levee to a finished crown width of 300 feet. The new levee would serve the same flood risk reduction function as a traditional levee, but its cross section would be wide enough to accommodate placement of structures on the landside of the levee outside the theoretical prism and access road. The Old River levee will be sufficiently wide to allow planting benches to be graded into the existing riverbank to allow for habitat plantings.

Paradise Cut Right Bank Levee – A new setback levee would be constructed along Paradise Cut. The setback levee would be widened levees similar to Old River. Once the new levee is in place, the existing Federal levee would be breached in several places and abandoned. Remnants of the levee would be left in place and revegetated to provide emergent/upland habitat for riparian brush rabbits. The overall effects of constructing the new setback levee and breaching the existing levee would be to widen the floodway and contribute towards reestablishing the design flow split between Paradise Cut and the San Joaquin River.

The proposed action also includes completion of a non-Federal cross levee immediately northwest of and parallel to the existing embankment that supports the UPRR tracks. Like the other new levees, the cross levee would be built to a design condition to resist a 0.5% (200-year) flood level plus 3 feet of freeboard, although it would be designed as a standard levee, not widened levee. While this levee work is not subject to Section 408 permission, it's connection to the Federal Paradise Cut levee is, as is ensuring the completed cross levee does not adversely affect the functioning the SJRTP.

Paradise Weir - The existing Paradise Weir near the San Joaquin River diversion would remain in place at its current width and elevation. The proposed action would include

removal of downstream sediment. Approximately 4–5 vertical feet of material would be removed from the existing 40-acre terrace bench across this area.

Design of the River Islands Phase 2B project was initiated in Fall 2015. Assuming timely receipt of all environmental clearances, approvals, permits, and authorizations, construction of levee alterations could begin in 2017.

2.0 Purpose of the SAR

The SAR is a strategic level review that should inform the USACE on the adequacy, appropriateness, and acceptability of the design and construction activities for the purpose of assuring public health, safety, and welfare. As a strategic level review, the SAR should not duplicate the Agency Technical Review, as described in USACE Engineering Regulation 1110-2-12, performed by USACE, which ensures the proper application of established criteria, regulations, laws, codes, principles, and professional practices.

3.0 SAR Panel

The SAR will be performed by a panel (referred to as the SAR Panel) of independent experts selected from among individuals who are distinguished experts in civil engineering, geotechnical engineering, hydraulic engineering, and other appropriate disciplines. Independent, in this instance, means that the persons selected to review the design are not involved in the original design and have no conflict of interest.

The independent external peer reviewers identified for the River Islands Phase 2B Project SAR Panel are Dr. David Williams, Mr. Ray Costa, Dr. Les Harder. Dr. Williams is an expert in hydrology and hydraulic engineering. Mr. Costa and Dr. Harder are experts in geotechnical and civil engineering specifically related to levee design. Resumes and conflict of interest disclosure forms are provided as attachments to this SAR Plan. The members of the panel have no conflicts of interest with respect to the River Islands at Lathrop Phase 2B project.

4.0 SAR Guidelines and Charge

The SAR Panel shall evaluate whether the interpretations of analysis and conclusions based on analysis are reasonable and inform the design team on the adequacy, appropriateness, and acceptability of the design and construction activities for the purpose of assuring public health, safety, and welfare. The SAR should focus on assumptions, data, methods, and models.

The SAR Panel will not present a final judgment on whether a project should be constructed or whether a particular plan should be implemented. Further, the SAR Panel should avoid findings that become "directives" in that they call for modifications or additional studies, or suggest new conclusions and recommendations. In such circumstances the SAR Panel may have assumed the

role of advisors as well as reviewers, thus introducing bias and potential conflict in their ability to provide objective review later in the project.

The SAR Panel should bring important issues to the attention of River Islands, including highlighting areas of disagreement and controversies that may need resolution. However, the SAR should not be expected to resolve fundamental disagreements and controversies.

The Charge provides guidance to the SAR Panel on the objectives of the SAR. The overarching Charge to the SAR Panel for the River Islands at Lathrop Phase 2B Project is to address the following questions:

1) Are the models used to assess hazards appropriate?

2) Are the assumptions made for the hazards appropriate?

3) Is the quality and quantity of the surveys, investigations, and engineering for the concept design sufficient to support the models and assumptions made for determining the hazards?

4) Does the analysis adequately address the uncertainty given the consequences associated with the potential for loss of life for this type of project?

5) Do the project features adequately address redundancy, resiliency, or robustness with an emphasis on interphases between structures, materials, members, and project phases?

6) From a public safety perspective, is the proposed alternative reasonable and appropriate, or are there other alternatives that should be considered?

7) Assess the recommended alternatives from the perspective of systems. Consider hydrologic and hydraulic effects throughout a watershed over time and considering the potential effects of climate change.

8) Do the assumptions made during design remain valid through construction as additional knowledge is gained?

9) For O&M manuals, do the requirements adequately maintain the conditions assumed during design and validated during construction; and will the project monitoring adequately reveal any deviations from assumptions made for performance and is sufficient to evaluate the change in project effectiveness? *(post-construction)*

In addition to the above, a specific Charge may be developed by River Islands prior to each SAR milestone.

5.0 Milestones and Schedule

A SAR will be conducted at 65% design and final design. Additionally, prior to breaching of the Federal levee, a SAR will be conducted. In advance of each SAR, River Islands will provide a specific charge appropriate for the specific milestone. The SAR may take different forms, but for most milestones, will include a meeting(s) for the purposes of presenting information and discussing the SAR Panel's response to the charge. In addition to the SAR Panel, representatives from DWR, USACE, and the California Central Valley Flood Protection Board (CVFPB) may be invited to participate. Site visits with the SAR Panel will be conducted at least twice.

Following the design phase, River Islands will seek input from the SAR Panel to resolve issues and address other potential concerns that may arise during construction. Summaries from construction meetings and other pertinent construction documentation will be provided to the SAR Panel. Significant issues will generate a formal SAR. Additional SAR may be conducted during design and construction as determined by the SAR Panel and River Islands.

6.0 Reporting & Documentation

At the conclusion of each SAR, the SAR Panel will prepare a SAR Report. The SAR Report, typically a letter, will summarize the review and respond to the Charge. The comments provided in a SAR Report will focus on the questions in the Charge. Comments in the SAR Report may not be attributable to any single SAR Panel member.

River Islands will consider and prepare responses to all comments. For comments and responses lacking concurrence, River Islands will provide an explanation for the lack of concurrence. The SAR Reports, and River Islands' response to comments directly supporting the SAR Panel 's response to the Charge, will be made available to the public through electronic means.

Attachments

Attachment 1 – Costa Resume and Conflict of Interest Form
Attachment 2 – Harder Resume and Conflict of Interest Form
Attachment 3 – Williams Resume and Conflict of Interest Form

RIVER ISLANDS AT LATHROP, PHASE 2B PROJECT SAFETY ASSURANCE REVIEW PLAN			
LOC	**RELEVANT TEXT IN SAR PLAN**	**COMMENT BY RMC**	**RESPONSE**
p. 4 Charge, #8	*8) Do the assumptions made during design remain valid through construction as additional knowledge is gained? (post-construction)*	This should be looked at during and after construction.	"*(post construction)*" was deleted from text.
p. 5 Section 5.0, para 2	*Following the design phase, River Islands will seek input from the SAR Panel to resolve issues and address other potential concerns that may arise during construction.*	SAR during construction is required no matter what.	Given the proposed breaching of the Federal levee, the SAR Plan was modified to be consistent with past projects that included setback levee/breaching. Specifically, an additional SAR milestone during construction prior to the breaching of the levee was included in Section 5.
p. 5 Section 5.0		What site visits are planned for the SAR panel?	The SAR Panel has already participated in several site visits to Stewart Tract (project site) since initial design began in 2015. The SAR Plan was revised to indicate that a minimum of two additional site visits will occur.
p. 5 Section 6.0		How will the SAR Review Report be approved?	Section 9. b. of EC214 discusses approval of the SAR Report for USACE civil works projects. Historically, 408 SAR Reports processed in Sacramento (through HQUSACE) have not been "approved" by any party. It's not clear what the purpose of the approval is, but if it's to ensure a SAR was performed, and responses were provided (in the case of USACE, the Division is approving a package with the SAR Panel's report and the District's responses) this intent is being met through 408 processing. Specifically, the Requestor is publishing the SAR Reports to their websites (as the District would) with comment responses and these are subsequently reviewed and considered by USACE in its decision making.

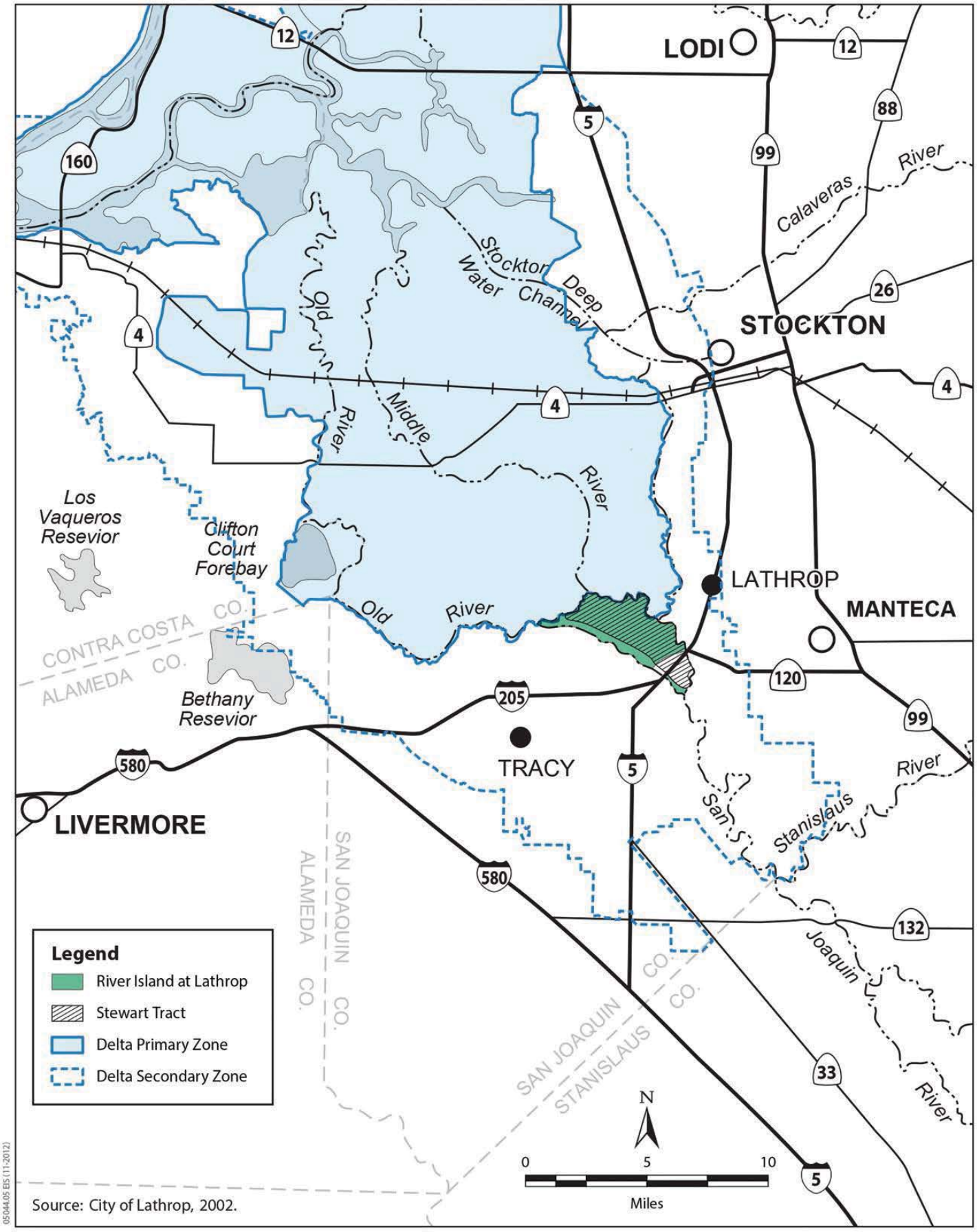
LODI
STOCKTON
LATHROP
MANTECA
TRACY
LIVERMORE
Los Vaqueros Resevior
Clifton Court Forebay
Bethany Resevior
Old River
Middle River
Old River
Stockton Deep Water Channel
Calaveras River
San Joaquin River
Stanislaus River
Joaquin River
CONTRA COSTA CO.
ALAMEDA CO.
SAN JOAQUIN CO.
STANISLAUS CO.
12
160
5
99
88
26
4
205
120
580
132
33
Legend
River Island at Lathrop
Stewart Tract
Delta Primary Zone
Delta Secondary Zone
N
0
5
10
Miles
Source: City of Lathrop, 2002.
05044.05 EIS (11-2012)

FIGURE 1

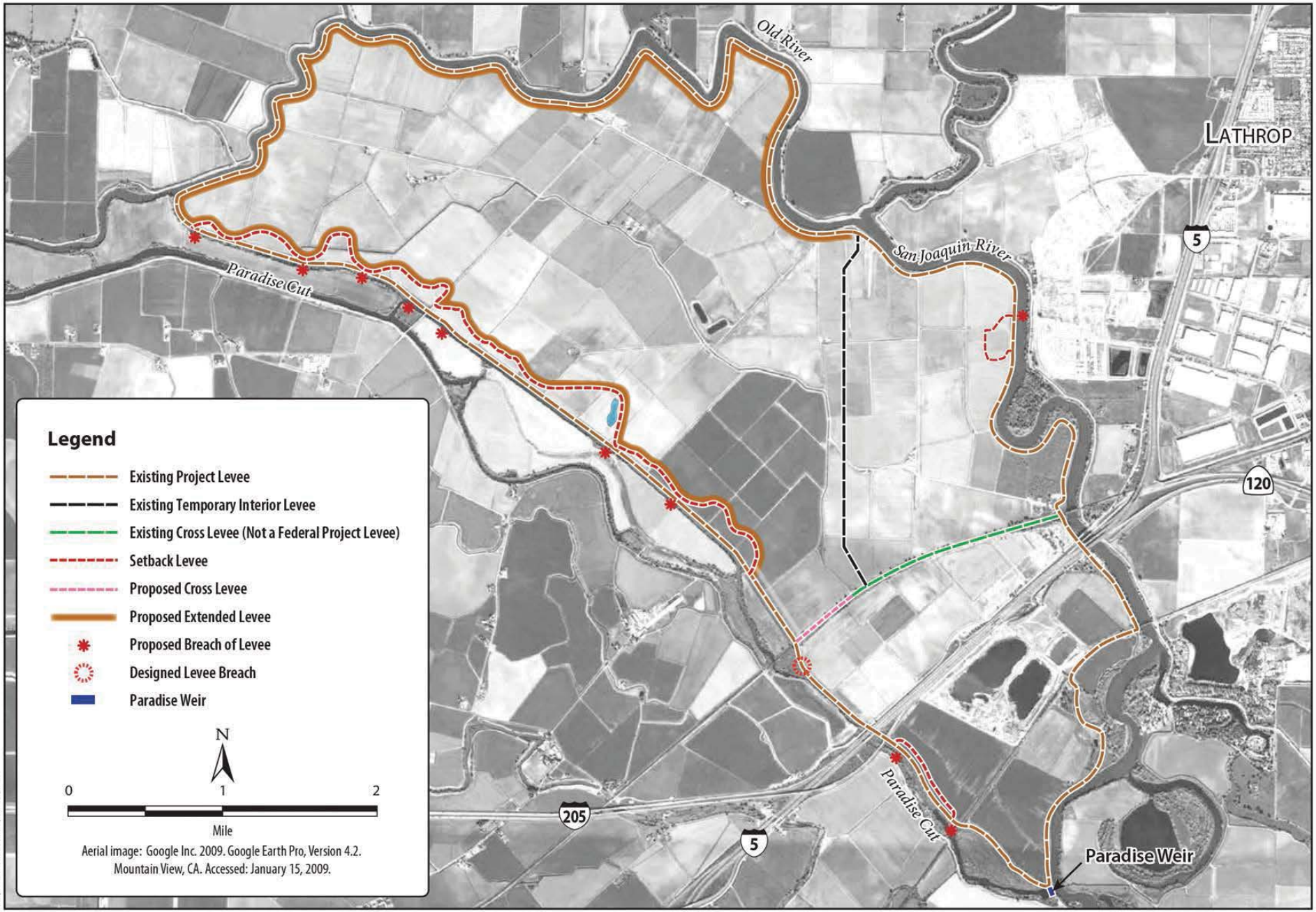
Old River
San Joaquin River
Paradise Cut
LATHROP
5
120
205
5
Paradise Cut
Paradise Weir
Legend
Existing Project Levee
Existing Temporary Interior Levee
Existing Cross Levee (Not a Federal Project Levee)
Setback Levee
Proposed Cross Levee
Proposed Extended Levee
Proposed Breach of Levee
Designed Levee Breach
Paradise Weir
N
0
1
2
Mile
Aerial image: Google Inc. 2009. Google Earth Pro, Version 4.2.
Mountain View, CA. Accessed: January 15, 2009.
Graphics... 05044 05 (3/4/13) AB

FIGURE 2

RAY COSTA, PE, GE

Education
BS Civil Engineering, University of California, Davis 1976

Registrations
Geotechnical Engineer, CA, 1987
Professional Engineer - Civil, CA, 1978

Experience Summary

Mr. Costa is a recognized expert in levee evaluation and seepage mitigation. He has performed evaluations and designed remediation measures for over 170 miles of levees in the Sacramento River Flood Control System. He has provided design, evaluation, and construction recommendations for numerous levees in the Sacramento area and northern California. He performed independent review and assisted in preparation of levee performance curves for the DWR Urban and Non-Urban Levee Evaluation programs. In this role, he performed technical review for over 1,200 miles of levees along the Sacramento and San Joaquin Rivers. He has participated in Expert Elicitations for the Natomas levee system as well as reliability impacts of vegetation, burrowing mammals, and deferred maintenance. Mr. Costa is currently involved with Safety Assurance Reviews for the SAFCA Local Area Project and Cache Creek setback levees. He also served as project manager for the SAFCA vegetation variance technical analyses for Natomas.

Select Project Experience

The following is a representative list of Mr. Costa's relevant project evaluation/design experience.

Levee Study	Client	Location
Marysville Levee	**Marysville Levee Commission**	**Marysville, California**
Yuba City Interceptor LD 1	**Yuba City Consortium**	**Yuba City, California**
NEMDC West Levee	**SAFCA**	**Sacramento, California**
NEMDC East Levee	**SAFCA**	**Sacramento, California**
Dry/Robla Creek Levee	**SAFCA**	**Sacramento, California**
Arcade Creek Levee	**SAFCA**	**Sacramento, California**
PIR Pocket Levee	**SAFCA**	**Sacramento, California**
PIR Bear River Levee	**RD 2103**	**Wheatland, California**
Natomas Internal Drainage Levees	**RD 1000**	**Sacramento, California**

North Beach Lake Levee	SAFCA	Sacramento, California
PIR Bear River and WPIC Levee	RD 784	Yuba County, California
PIR Feather and Yuba River Levees	TRLIA	Yuba County, California
Cache Creek Setback Levee	DWR	Yolo County, California
PIR Sacramento River (Natomas)	SAFCA	Sacramento and Sutter Counties
PIR Natomas Cross Canal (Natomas)	SAFCA	Sutter County, California
PIR Lower American River (Natomas)	SAFCA	Sacramento County, California
Natomas Setback Levee	SAFCA	Sacramento and Sutter Counties, California
Site 20 (Feather River Levee)	USACE	Sutter County, California
Pocket Levee (Seepage)	USACE	Sacramento, California
Pocket Levee (Sites 2 and 9)	HDR	Sacramento, California
Pocket Levee (Underseepage Control)	SAFCA	Sacramento, California
PIR West Sacramento	RD 900	Yolo County, California
PL 84-99 Levee Repairs	USACE	Sacramento and Sutter Counties, California
PIR Sutter County Levees	County of Sutter	Sutter County, California
Mayhew Drain Levee	SAFCA	Sacramento County, California
San Marcos Levee	Parsons Brinckerhoff	San Marcos, California
Lake County Levee Breach	County of Lake	Lake County, California
Old Sugar Mill Levee Study	County of Yolo	Clarksburg, California
Pioneer Reservoir Levee Seepage Evaluation Study	Nichols Consulting Engineers	Sacramento, California
Dry Creek Levee	RD 2103 and RD 817	Wheatland, California
Seepage Evaluation	LD 9	Sutter County, California

BI/COI FORM 3

The National Academies of
SCIENCES · ENGINEERING · MEDICINE

BACKGROUND INFORMATION AND CONFIDENTIAL CONFLICT OF INTEREST DISCLOSURE

For General Scientific and Technical Studies and Assistance

NAME	**Raymond Costa, P.E., G.E.**
TELEPHONE	(916) 416-8880
ADDRESS	6187 Reservoir Court Granite Bay, CA 95746
EMAIL	rcosta.ge@gmail.com
CURRENT EMPLOYER	Self-Employed
COMMITTEE	River Islands at Lathrop Phase 2B Project, USACE 33 USC 408 Safety Assurance Review Panel

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There are two parts to this form, Part I Background Information, and Part II Confidential Conflict of Interest Disclosure. Complete both parts, **sign** and **date** this form on the last page, and return the form to the responsible staff officer for the project and committee activity to which this form applies. **Retain a copy for your records.**

PART I **BACKGROUND INFORMATION**

INSTRUCTIONS

Please provide the information requested below regarding **relevant** organizational affiliations, government service, public statements and positions, research support, and additional information (if any). Information is "relevant" if it is related to -- and might reasonably be of interest to others concerning -- your knowledge, experience, and personal perspectives regarding the subject matter and issues to be addressed by the committee activity for which this form is being prepared. If some or all of the requested information is contained in your curriculum vitae, you may if you prefer simply attach your CV to this form, supplemented by additional responses or comments below as necessary.

I. ORGANIZATIONAL AFFILIATIONS. Report your relevant business relationships (as an employee, owner, officer, director, consultant, etc.) and your relevant remunerated or volunteer non-business relationships (e.g., professional organizations, trade associations, public interest or civic groups, etc.).

Principal Engineer – Raymond Costa, Jr., PE Consulting Engineer
California Department of Water Resources - Safety Assurance Reviewer; Cache Creek Setback Levees.
City of Marysville, California – Geotechnical consultant for levee certification to FEMA.
River Islands Development Corporation, California – Member of Board of Senior Consultants for ULDC levee accreditation and certification to FEMA.
Sacramento Area Flood Control Agency – Member of Board of Senior Consultants for review of geotechnical studies and design of levee improvements.

II. GOVERNMENT SERVICE. Report your relevant service (full-time or part-time) with federal, state, or local government in the United States (including elected or appointed positions, employment, advisory board memberships, military service, etc.).

None

III. RESEARCH SUPPORT. Report relevant information regarding both public and private sources of research support (other than your present employer), including sources of funding, equipment, facilities, etc.

No current research

IV. PUBLIC STATEMENTS AND POSITIONS. List your relevant articles, testimony, speeches, etc., by date, title, and publication (if any) in which they appeared, or provide relevant representative examples if numerous. Provide a brief description of relevant positions of any organizations or groups with which you are closely identified or associated.

None applicable

V. ADDITIONAL INFORMATION. If there are relevant aspects of your background or present circumstances not addressed above that might reasonably be construed by others as affecting your judgment in matters within the assigned task of the committee or panel on which you have been invited to serve, and therefore might constitute an actual or potential source of bias, please describe them briefly.

None applicable

PART II **CONFIDENTIAL CONFLICT OF INTEREST DISCLOSURE**

INSTRUCTIONS

It is essential that the work of committees of the institution used in the development of reports not be compromised by any significant conflict of interest. For this purpose, **the term "conflict of interest" means any financial or other interest which conflicts with the service of the individual because it (1) could significantly impair the individual's objectivity or (2) could create an unfair competitive advantage for any person or organization.** Except for those situations in which the institution determines that a conflict of interest is unavoidable and promptly and publicly discloses the conflict of interest, no individual can be appointed to serve (or continue to serve) on a committee of the institution used in the development of reports if the individual has a conflict of interest that is relevant to the functions to be performed.

The term "conflict of interest" means something more than individual bias. There must be an *interest,* ordinarily financial, that could be directly affected by the work of the committee.

Conflict of interest requirements are *objective* and *prophylactic.* They are not an assessment of one's actual behavior or character, one's ability to act objectively despite the conflicting interest, or one's relative insensitivity to particular dollar amounts of specific assets because of one's personal wealth. Conflict of interest requirements are objective standards designed to eliminate certain specific, potentially compromising situations from arising, and thereby to protect the individual, the other members of the committee, the institution, and the public interest. The individual, the committee, and the institution should not be placed in a situation where others could reasonably question, and perhaps discount or dismiss, the work of the committee simply because of the existence of conflicting interests.

The term "conflict of interest" applies only to *current interests*. It does not apply to past interests that have expired, no longer exist, and cannot reasonably affect current behavior. Nor does it apply to possible interests that may arise in the future but do not currently exist, because such future interests are inherently speculative and uncertain. For example, a pending formal or informal application for a particular job is a current interest, but the mere possibility that one might apply for such a job in the future is <u>not</u> a current interest.

The term "conflict of interest" applies not only to the personal interests of the individual but also to the *interests of others* with whom the individual has substantial common financial interests if these interests are relevant to the functions to be performed. Thus, in assessing an individual's potential conflicts of interest, consideration must be given not only to the interests of the individual but also to the interests of the individual's spouse and minor children, the individual's employer, the individual's business partners, and others with whom the individual has substantial common financial interests. Consideration must also be given to the interests of those for whom one is acting in a

fiduciary or similar capacity (e.g., being an officer or director of a corporation, whether profit or nonprofit, or serving as a trustee).

Much of the work of this institution involves scientific and technical studies and assistance for sponsors across a broad range of activities. Such activities may include, for example: defining research needs, priorities, opportunities and agendas; assessing technology development issues and opportunities; addressing questions of human health promotion and assessment; providing scientific and technical assistance and supporting services for government agency program development; assessing the state of scientific or technical knowledge on particular subjects and in particular fields; providing international and foreign country science and technology assessments, studies and assistance. Such activities frequently address scientific, technical, and policy issues that are sufficiently broad in scope that they do not implicate specific financial interests or conflict of interest concerns.

However, where such activities address more specific issues having significant financial implications -- e.g., funding telescope A versus telescope B, government development or evaluation of a specific proprietary technology, promotion or endorsement of a specific form of medical treatment or medical device, connecting foreign research facilities to specific commercial interests, making recommendations to sponsors regarding specific contract or grant awards, etc. -- careful consideration must be given to possible conflict of interest issues with respect to the appointment of members of committees that will be used by the institution in the development of reports to be provided by the institution to sponsoring agencies.

The overriding objective of the conflict of interest inquiry in each case is to identify whether there are interests – primarily financial in nature – that conflict with the committee service of the individual because they could impair the individual's objectivity or could create an unfair competitive advantage for any person or organization. The fundamental question in each case is does the individual, or others with whom the individual has substantial common financial interests, have identifiable interests that could be directly affected by the outcome of the project activities of the committee on which the individual has been invited to serve? For projects involving advice regarding awards of contracts, grants, fellowships, etc., this institution is also guided by the principle that an individual should not participate in any decision regarding the award of a contract or grant or any other substantial economic benefit to the individual or to others with whom the individual has substantial common financial interests or a substantial personal or professional relationship.

The application of these concepts to specific scientific and technical studies and assistance projects must necessarily be addressed in each case on the basis of the particular facts and circumstances involved. The questions set forth below are designed to elicit information from you concerning possible conflicts of interest that are relevant to the functions to be performed by the particular committee on which you have been invited to serve.

1. FINANCIAL INTERESTS. (a) Taking into account stocks, bonds, and other financial instruments and investments including partnerships (but excluding broadly diversified mutual funds and any investment or financial interests valued at less than $10,000), do you or, to the best of your knowledge others with whom you have substantial common financial interests, have financial investments that could be affected, either directly or by a direct effect on the business enterprise or activities underlying the investments, by the outcome of the project activities of the committee on which you have been invited to serve?

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(d) Taking into account research funding and other research support (e.g., equipment, facilities, industry partnerships, research assistants and other research personnel, etc.), could your current research funding and support (or that of your close research colleagues and collaborators) be directly affected by the outcome of the project activities of the committee on which you have been invited to serve?

(e) Could your service on the committee on which you have been invited to serve create a specific financial or commercial competitive advantage for you or others with whom you have substantial common financial interests?

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2. OTHER INTERESTS. (a) Is the central purpose of the project for which this disclosure form is being prepared a critical review and evaluation of your own work or that of your employer?

(b) Do you have any existing professional obligations (e.g., as an officer of a scientific or engineering society) that effectively require you to publicly defend a previously established position on an issue that is relevant to the functions to be performed in this committee activity?
(c) To the best of your knowledge, will your participation in this committee activity enable you to obtain access to a competitor's or potential competitor's confidential proprietary information?

(d) If you are or have ever been a U.S. Government employee (either civilian or military), to the best of your knowledge are there any federal conflict of interest restrictions that may be applicable to your service in connection with this committee activity?

(e) If you are a U.S. Government employee, are you currently employed by a federal agency that is sponsoring this project? If you are not a U.S. Government employee, are you an employee of any other sponsor (e.g., a private foundation) of this project?

(f) If the committee activity for which this form is being prepared involves reviews of specific applications and proposals for contract, grant, fellowship, etc. awards to be made by sponsors, do you or others with whom you have substantial common financial interests, or a familial or substantial professional relationship, have an interest in receiving or being considered for awards that are currently the subject of the review being conducted by this committee?

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EXPLANATION OF "YES" RESPONSES:

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Raymond Costa
SIGNATURE

DATE 3 Aug 2016

Reviewed by: _____
Executive Director

_____
Date

Leslie F. Harder, Ph.D., P.E., G.E.

Geotechnical Lead/Advisor

Education

Ph.D., Civil Engineering, University of California, Berkeley, December 1988

Master of Science, Civil Engineering, University of California, Davis, September 1977

Bachelor of Science, Civil Engineering, University of California, Davis, 1975

Professional Registrations

Registered Civil Engineer, California, 1979 (No. C 30472)

Registered Geotechnical Engineer, California, 1985 (No. GE 000378)

Professional Affiliations

American Society of Civil Engineers

American Society for Testing Materials

International Society of Soil Mechanics

Earthquake Engineering Research Institute

United States Society on Dams

Geotechnical Extreme Event Reconnaissance Association

HDR Tenure

8 Years

Industry Tenure

37 Years

Professional Experience

Dr. Harder is a *Senior Professional Associate* who serves as a Senior Water Resources Technical Advisor in the Folsom office. His primary duties are to manage and provide technical support for the planning and design of water resources and environmental restoration related projects. These projects include conducting hydrology and hydraulic analyses, conducting flood hazard assessments, formulating flood damage reduction plans, conducting reconnaissance and feasibility level planning studies, and preparing final designs and construction documents.

Prior to joining HDR, he was the Deputy Director for Public Safety for the California Department of Water Resources (DWR). During his 30-year tenure with DWR, Dr. Harder successfully completed numerous projects in both individual and supervisory capacities. While with the Department, Dr. Harder completed the more complex geotechnical reevaluations and designs of major dams and embankments on the State Water Project. He was also extensively involved with engineering projects in the Sacramento-San Joaquin Delta, some of which included developing levee standards and completing conceptual designs for future Delta facilities, supervising several seismic stability evaluations, and directing several emergency levee repairs. While serving as Deputy Director, he also worked with numerous stakeholders and the legislature in crafting the bond measure for flood improvement, Proposition 1E, passed by the voters in 2006, and the landmark flood legislation that was by the legislature in October 2007. He was instrumental in creating the FloodSAFE California program and was the executive manager for the emergency repair of over 100 levee sites in 2006-2007.

Dr. Harder is also recognized as an international expert on liquefaction, and in particular, the liquefaction of gravelly soils. He developed the Becker Penetration Test and has consulted on several dam projects where foundation gravels were of concern. Clients for this work included the United States Bureau of Reclamation, B C Hydro, Greater Vancouver Water District, and the United States Army Corps of Engineers (USACE). Among the projects Dr. Harder has consulted on for USACE is the interpretation of the gravelly dredge tailings which form part of the foundation beneath Mormon Island Auxiliary Dam which helps retain Folsom Reservoir.

He has also participated in numerous reconnaissance studies on the performance of dams and levees following strong earthquake, hurricane, or flood events. Some of these reconnaissance efforts include the 1989 Loma Prieta Earthquake, 1994 Northridge Earthquake, 1995 Kobe, Japan Earthquake, 1999 Chi Chi, Taiwan Earthquake, 2001 Bhuj, India Earthquake, 2005 Hurricanes Katrina and Rita, 2008 Midwest Floods, 2008 Hurricane Gustav, 2011 Tohoku, Japan Earthquake and Tsunami events, and the 2014 South Napa Earthquake. He has served on several joint State-Federal levee panels, including the 2003 Levee Seepage Task Force, and was appointed by the Assistant Secretary of the Army to the National Committee on Levee Safety in 2008.

Project Experience

Santa Clara Valley Water District (SCVWD), Anderson Dam Seismic Retrofit Planning and Environmental Consultant Services, Santa Clara, CA. Lead the preparation of planning study documents, including the Problem Definition Report, Conceptual Alternatives Report, and the Planning Study Report. The ultimate outcome of the planning services was the preliminary design of a Staff Recommended Alternative to: 1) resolve the seismic deficiencies in the dam embankment from the maximum creditable earthquake; 2) replace the outlet works for the potential fault rupture risk from a maximum creditable earthquake; and 3) to update the Probable Maximum Flood (PMF) and develop measures to address deficiencies with the spillway.

California Department of Water Resources (DWR), Castaic Dam Left Abutment Stability, Santa Clarita, CA. Conducted independent evaluation of geologic conditions, seismic response, and performance monitoring instrumentation data to evaluate the stability of the left abutment of the 400-foot-high Castaic Dam. Evaluations included back-calculations of abutment landsliding, increases in groundwater over time, and the potential for earthquake-induced displacements. Reviewed new 3-D geologic models and recommended additional geotechnical investigations and replacements for deteriorating instrumentation.

Grant County Public Utility District, Ephrata, WA. Currently serves on independent Board of Consultants for the seismic reevaluation, risk analyses, and retrofit design of Wanapum and Priest Rapids Dams. Duties include independent expert review of geotechnical investigations, site characterizations, seismic response and deformation analyses, risk analyses, and preliminary seismic retrofit designs.

California Department of Water Resources (DWR), B. F. Sisk San Luis Dam, Los Banos, CA. Currently serves on independent Consulting Review Board for the seismic reevaluation and retrofit design of Sisk Dam. Duties include independent expert review of geotechnical investigations, site characterizations, seismic response and deformation analyses, and preliminary seismic retrofit designs developed by the United States Bureau of Reclamation.

Miami Conservancy District, Dayton, OH. Served on 2010 and 2014 Independent Board of Consultants panels to review seepage and performance of five hydraulic fill dams: Germantown, Englewood, Lockington, Taylorsville, and Huffman. These dams were constructed between 1918 and 1922 and have concrete conduits and spillways that are used to control discharge of accumulated upstream flood waters through the dams. Duties include field inspections, review of condition assessments, and the construction of relief wells to provide seepage control.

California Department of Water Resources (DWR), State Water Project Dams, CA. Served as subject matter expert in 2014-2015 Potential Failure Mode Analyses for several State Water Project Dams in California, including Oroville Dam, Thermalito Forebay Dam, Thermalito Afterbay Dam, Pyramid Dam, Quail Dam, and Cedar Springs Dams. Duties included providing technical backgrounds on the dams, providing insight on relative risks, and participating in PFMA process with DWR and FERC.

Feather River West Levee Rehabilitation Early Implementation Project – Sutter Butte Flood Control Agency, Sutter and Butte Counties, CA. Strategic/Technical Advisor. Dr. Harder is leading a group of strategic/technical advisors who are providing engineering oversight of this levee project that involves the rehabilitation, restoration and necessary improvements to 44 miles of the west levee of the Feather River. The goal of the project is two-fold: 1) to rehabilitate the levee so that segments 1-7 can be accredited as meeting FEMA standards for providing protection against the 100-year flood event, and 2) to rehabilitate the levee so that segments 1-6 meet the new state standard of 200-year flood protection for urban areas.

Program Management Services for Alaska Railroad Northern Rail Extension Project. In this landmark project for Alaska, the Alaska Railroad Corporation (ARRC) plans to extend its rail line from Eielson Air Force Base to Delta Junction. HDR was contracted as Program Manager to manage 3rd party relations, maintain cost and control, and lead an extensive outreach program.

Upper Yuba River Levee Improvement Project – Three Rivers Levee Improvement Authority. Providing engineering analyses and design services to identify problems and provide corrective information and documents (PIRs, TMs, PS&E and environmental documentation) to support the repair of the a reach along the Yuba River South Levee (from SR70 to Yuba Gold Fields) in order to achieve FEMA certification.

Specifically, services include: geotechnical investigations and lab testing, topographic data acquisition, preliminary engineering and alternatives analyses, preparation of Technical Memos, preparation of a Problem Identification Report, development of final construction documents (plans, specifications, and construction cost estimate); preparation of Basis of Design documents,

construction permit application preparation, environmental analyses and documentation, preparation of DWR EIP project documentation, and preparation of FEMA Levee Certification documents (as required).

Natomas Levee Improvement Program – Sacramento Area Flood Control Agency (SAFCA), Sacramento, CA. Chair, Board of Senior Advisors. Led the group of senior technical advisors who provided oversight of this levee repair project that includes a drainage study, pre-design, design, environmental documentation, permitting assistance, bid period, and construction support services on approximately 4 miles of levees on the lower Sacramento River and the American River. Levee repairs were needed to retain FEMA certification and achieve a 200-year level of flood protection, and included levee crown raising for all four reaches, seepage berms (2 and 5A), and cutoff walls (4B). Redesign of the Garden Highway was required along the project reaches, as well as relocation of utilities and other infrastructure. Dr. Harder's specific area of oversight was geotechnical engineering.

Flood Risk Assessment for Sewer Interceptor System Facilities – Sacramento Regional County Sanitation District, County of Sacramento, CA. Evaluated flood risk, prediction of flood-related damage, and recommended procedures and improvements at the South River Pump Station, as well as performed preliminary flood risk assessment for 17 other pump stations/facilities located at various locations around the Sacramento County region. The South River Pump Station study included a comprehensive evaluation of the current level of flood protection, evaluation of the impacts of the 100- and 200-year storm events caused by local flooding and/or levee failure on the Sacramento River in the vicinity of the station, and analysis of alternatives for improvements that would provide additional flood protection. Alternatives that were evaluated included construction of a stormwater retention basin, construction of a perimeter ring wall or ring levee around the pump station, relocation of RD 900 southern levee, and University Park development proposed levee improvements. The study of additional pump station/interceptor system facilities included an evaluation of the existing level of flood protection provided by the existing local levee, channel, and storm drainage systems for the Arden Pump, New Natomas Pump, Natomas Pump, Van Maren Pump, Northeast Pump, and Cordova Pump Stations, Northeast Siphon Inlet Structure, Northeast Siphon Outlet Structure, Combined Wastewater Treatment Plant, City Interceptor Valve Structure, City Interceptor Oxygen Structure, Sump 119, Sump 55, City Interceptor Air Intake Structure, Sump 2, Sacramento Regional Wastewater Treatment Plant (SRWTP) Equalization Structure, and SRWTP Influent Diversion Structure. The evaluation included the predicted maximum depth of floodwaters and duration of flooding during the 100- and 200-year flood events.

Environmental Compliance and Regulatory Permitting – SAFCA, Sacramento, CA. HDR is providing general technical advice and quality assurance technical services to the Sacramento Area Flood Control Agency for quality assurance of Environmental Compliance and Regulatory Permitting activities of the Natomas Levee Improvement Program. The project involves the investigation, design, permitting, and construction of levee improvements along the Natomas Cross Canal South Levee, the Sacramento River East Levee, the American River North Levee, and related infrastructure. HDR's role is to assist SFACA with quality assurance of the work products produced by the environmental and regulatory permitting team members and to provide general technical advice and design coordination assistance to SAFCA.

American River Common Features WRDA96 Remaining Sites – U.S. Army Corps of Engineers (USACE), Sacramento District, Sacramento, CA. Lead Geotechnical Engineer. Directed the geotechnical portion of this project by providing evaluation and design of levee improvements for the 10 sites along the American River. Work included seepage and slope stability analyses; establishing the need for levee remediation; determining the locations for remediation and develop alternative methods of remediation; construction plans and specifications; Design Documentation Report (DDR); identification of relocations including utility relocations; rights-of-way and temporary construction easement requirements; ECIFP report, formulating an M-CACES cost estimate; and preparing a Quality Control Plan.

Marysville Ring Levee – USACE, Sacramento District, Yuba County, CA. Lead Geotechnical Engineer. Directing geotechnical tasks related to the design of levee improvements

that meet FEMA requirements for levee accreditation under the National Flood Insurance Program.

National Levee Safety Committee. Appointed by the Assistant Secretary of the Army as one of two private-sector members serving on the National Committee on Levee Safety. As Chair of two subcommittees and a lead member of the NLSC, helped develop recommendations and a strategic plan for a National Levee Safety Program that was submitted to the United States Congress on January 15, 2009. Testified before Congress on the recommendations in May 2009.

West Sacramento Implementation Design – City of West Sacramento, West Sacramento CA. Provided preliminary geotechnical services for evaluation of underseepage, slope stability and erosion assessment for a portion of the levee system surrounding West Sacramento. Performed problem identification and alternatives analysis as a preliminary level investigation of possible improvements to the levee system.

FEMA Levee Certification Project Phase II – San Bernardino County Flood Control District, San Bernardino, CA. The District has been tasked with evaluating and certifying existing levees within San Bernardino County based on FEMA's regulatory requirements as identified in Title 44 of the Code of Federal Regulations (CFR), Section 65.10 (44 CFR 65.10). The evaluation and certification of levees is based on design criteria (freeboard, closures, embankment protection, embankment and foundation stability, settlement, and interior drainage), operation plans and criteria (for closures and interior drainage), maintenance plans and criteria, and the actual certification requirements (i.e. as-builts, forms, documentation, and data).

BI/COI FORM 3

The National Academies of
SCIENCES · ENGINEERING · MEDICINE

BACKGROUND INFORMATION AND CONFIDENTIAL CONFLICT OF INTEREST DISCLOSURE

For General Scientific and Technical Studies and Assistance

NAME	**Leslie Harder, Ph.D., P.E., G.E.**
TELEPHONE	(916) 817-4973
ADDRESS	HDR Engineering, Inc 2365 Iron Point Road, Suite 300 Folsom, CA 95630-8709
EMAIL	Les.Harder@hdrinc.com
CURRENT EMPLOYER	HDR Engineering, Inc
COMMITTEE	River Islands at Lathrop Phase 2B Project, USACE 33 USC 408 Safety Assurance Review Panel

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There are two parts to this form, Part I Background Information, and Part II Confidential Conflict of Interest Disclosure. Complete both parts, **sign** and **date** this form on the last page, and return the form to the responsible staff officer for the project and committee activity to which this form applies. **Retain a copy for your records**.

PART I **BACKGROUND INFORMATION**

INSTRUCTIONS

Please provide the information requested below regarding **relevant** organizational affiliations, government service, public statements and positions, research support, and additional information (if any). Information is "relevant" if it is related to -- and might reasonably be of interest to others concerning -- your knowledge, experience, and personal perspectives regarding the subject matter and issues to be addressed by the committee activity for which this form is being prepared. If some or all of the requested information is contained in your curriculum vitae, you may if you prefer simply attach your CV to this form, supplemented by additional responses or comments below as necessary.

I. ORGANIZATIONAL AFFILIATIONS. Report your relevant business relationships (as an employee, owner, officer, director, consultant, etc.) and your relevant remunerated or volunteer non-business relationships (e.g., professional organizations, trade associations, public interest or civic groups, etc.).

Currently employed as Senior Professional Associate with HDR Engineering, Inc. – office located in Folsom, CA (2008 to present)- Resume attached.

Current Membership in following Professional Organizations:
American Society of Civil Engineers (ASCE)
American Society for Testing Materials (ASTM)
Association of State Dam Safety Officials (ASDSO)
Earthquake Engineering Research Institute (EERI)
Geotechnical Extreme Event Reconnaissance Association (GEER)
International Society of Soil Mechanics (ISSM)
United States Society on Dams (USSD)

II. GOVERNMENT SERVICE. Report your relevant service (full-time or part-time) with federal, state, or local government in the United States (including elected or appointed positions, employment, advisory board memberships, military service, etc.).

Previously employed by the California Department of Water Resources (1976 to 2007) – began as a Graduate Student Assistant and ended DWR career at Deputy Director

Appointed member to National Committee on Levee Safety (2008-2013) – appointed by Assistant Secretary of the Army

III. RESEARCH SUPPORT. Report relevant information regarding both public and private sources of research support (other than your present employer), including sources of funding, equipment, facilities, etc.

N/A

IV. PUBLIC STATEMENTS AND POSITIONS. List your relevant articles, testimony, speeches, etc., by date, title, and publication (if any) in which they appeared, or provide relevant representative examples if numerous. Provide a brief description of relevant positions of any organizations or groups with which you are closely identified or associated.

List of Publications Attached.

Testified twice before United States Congress:

1. ***Testified on H.R. 6014 regarding maintenance needs for Delta Levees while Deputy Director for CDWR (September 7, 2006)***
2. ***Testified on need for National Levee Policy and recommendations made by National Committee on Levee Safety (May 19, 2009)***

V. ADDITIONAL INFORMATION. If there are relevant aspects of your background or present circumstances not addressed above that might reasonably be construed by others as affecting your judgment in matters within the assigned task of the committee or panel on which you have been invited to serve, and therefore might constitute an actual or potential source of bias, please describe them briefly.

N/A

PART II **CONFIDENTIAL CONFLICT OF INTEREST DISCLOSURE**

INSTRUCTIONS

It is essential that the work of committees of the institution used in the development of reports not be compromised by any significant conflict of interest. For this purpose, **the term "conflict of interest" means any financial or other interest which conflicts with the service of the individual because it (1) could significantly impair the individual's objectivity or (2) could create an unfair competitive advantage for any person or organization.** Except for those situations in which the institution determines that a conflict of interest is unavoidable and promptly and publicly discloses the conflict of interest, no individual can be appointed to serve (or continue to serve) on a committee of the institution used in the development of reports if the individual has a conflict of interest that is relevant to the functions to be performed.

The term "conflict of interest" means something more than individual bias. There must be an *interest,* ordinarily financial, that could be directly affected by the work of the committee.

Conflict of interest requirements are *objective* and *prophylactic.* They are not an assessment of one's actual behavior or character, one's ability to act objectively despite the conflicting interest, or one's relative insensitivity to particular dollar amounts of specific assets because of one's personal wealth. Conflict of interest requirements are objective standards designed to eliminate certain specific, potentially compromising situations from arising, and thereby to protect the individual, the other members of the committee, the institution, and the public interest. The individual, the committee, and the institution should not be placed in a situation where others could reasonably question, and perhaps discount or dismiss, the work of the committee simply because of the existence of conflicting interests.

The term "conflict of interest" applies only to *current interests*. It does not apply to past interests that have expired, no longer exist, and cannot reasonably affect current behavior. Nor does it apply to possible interests that may arise in the future but do not currently exist, because such future interests are inherently speculative and uncertain. For example, a pending formal or informal application for a particular job is a current interest, but the mere possibility that one might apply for such a job in the future is <u>not</u> a current interest.

The term "conflict of interest" applies not only to the personal interests of the individual but also to the *interests of others* with whom the individual has substantial common financial interests if these interests are relevant to the functions to be performed. Thus, in assessing an individual's potential conflicts of interest, consideration must be given not only to the interests of the individual but also to the interests of the individual's spouse and minor children, the individual's employer, the individual's business partners, and others with whom the individual has substantial common financial interests. Consideration must also be given to the interests of those for whom one is acting in a

fiduciary or similar capacity (e.g., being an officer or director of a corporation, whether profit or nonprofit, or serving as a trustee).

Much of the work of this institution involves scientific and technical studies and assistance for sponsors across a broad range of activities. Such activities may include, for example: defining research needs, priorities, opportunities and agendas; assessing technology development issues and opportunities; addressing questions of human health promotion and assessment; providing scientific and technical assistance and supporting services for government agency program development; assessing the state of scientific or technical knowledge on particular subjects and in particular fields; providing international and foreign country science and technology assessments, studies and assistance. Such activities frequently address scientific, technical, and policy issues that are sufficiently broad in scope that they do not implicate specific financial interests or conflict of interest concerns.

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If the answer to any of the above questions under FINANCIAL INTERESTS is "yes," check here ____ (YES), and briefly describe the circumstances on the last page of this form.

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(c) To the best of your knowledge, will your participation in this committee activity enable you to obtain access to a competitor's or potential competitor's confidential proprietary information?

(d) If you are or have ever been a U.S. Government employee (either civilian or military), to the best of your knowledge are there any federal conflict of interest restrictions that may be applicable to your service in connection with this committee activity?

(e) If you are a U.S. Government employee, are you currently employed by a federal agency that is sponsoring this project? If you are not a U.S. Government employee, are you an employee of any other sponsor (e.g., a private foundation) of this project?

(f) If the committee activity for which this form is being prepared involves reviews of specific applications and proposals for contract, grant, fellowship, etc. awards to be made by sponsors, do you or others with whom you have substantial common financial interests, or a familial or substantial professional relationship, have an interest in receiving or being considered for awards that are currently the subject of the review being conducted by this committee?

(g) If the committee activity for which this form is being prepared involves developing requests for proposals, work statements, and/or specifications, etc., are you interested in seeking an award under the program for which the committee on which you have been invited to serve is developing the request for proposals, work statement, and/or specifications -- or, are you employed in any capacity by, or do you have a financial interest in or other economic relationship with, any person or organization that to the best of your knowledge is interested in seeking an award under this program?

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EXPLANATION OF "YES" RESPONSES:

[insert here]

During your period of service in connection with the activity for which this form is being completed, any changes in the information reported, or any new information, which needs to be reported, should be reported promptly by written or electronic communication to the responsible staff officer.

SIGNATURE DATE **August 24, 2016**

Reviewed by: _____ _____
Executive Director Date

Embankment Dam and Geotechnical Earthquake Engineering Publications

1. **Harder, Jr., Leslie Frederick** (1977), "*Liquefaction of Sand under Irregular Loading Conditions*," Thesis submitted in partial satisfaction of the requirements for the degree of Master of Science, College of Engineering, University of California, Davis,.

2. Shen, C. K., **Harder, L. F**., Vrymoed, J. L., and Bennett, W. J. (1978), "*Dynamic Response of a Sand under Random Loadings*," Proceedings of the ASCE Geotechnical Engineering Division Specialty Conference Earthquake Engineering and Soil Dynamics, American Society of Civil Engineers, Pasadena, California, June 19-21, 1978, pp. 852-863.

3. Hammond, William D, and **Harder, Leslie F.** (1979), "*Oroville Dam: Evaluation of Seismic Stability*," The August 1, 1975 Oroville Earthquake Investigations, Bulletin 203-78, Chapter V, Department of Water Resources, The Resources Agency, State of California, February 19, 1979.

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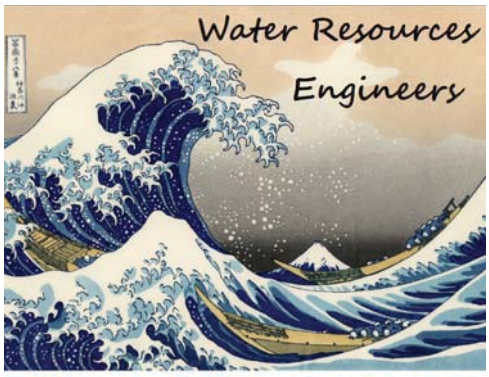

DTW and Associates, LLC

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Education

Ph.D., Civil Engineering, Colorado State University
M.S., Civil Engineering, University of California, Davis
B.S., Civil Engineering, University of California, Davis

Registrations

Professional Engineer (Civil) license number and date:

Arizona 24349, 1990
Colorado 42353, 2008
Louisiana, 34075, 2009
New Mexico 12187, 1993
Texas 80003, 1994
Missouri 2012015265, 2011
California 57020, 1997
Hawaii 7796, 1993
Mississippi 08242, 1981
Oregon 16963, 1993
Washington 27190, 1990

Registered Professional Hydrologist (PH: 96-H-1146)
Certified Professional, Erosion and Sediment Control (CPESC: #703)
Certified Floodplain Manager (CFM; US-08-03224)

Work History

2011 – 2012: Director of Water Resources, NV5, Centennial, CO

2008 – Present; President, David T. Williams and Associates, Engineers, LLC, Fort Collins, CO

2005 - 2008; National Technical Director for Water Resources, PBS&J, Fort Collins, CO

2002 - 2005; National Director for Hydrology and Hydraulics, HDR Engineering, San Diego, CA

1988 - 2002; President and co-founder of WEST Consultants, a premier water resources engineering firm

1979 - 1988; Research Hydraulic Engineer, Hydraulics Lab, Engineering and Research Development Center (formerly Waterways Experiment Station), Vicksburg, MS

1983 - 1984; Acting Chief, Hydrology and Hydraulics Section, Baltimore District Corps of Engineers

1977 - 1979; Civil Engineer, Hydrology Branch, Nashville District Corps of Engineers

1975 - 1977; Research Hydraulic Engineer, Planning Branch and Research Branch, Hydrologic Engineering Center (HEC), Davis, CA

1972 - 1975; Infantry Platoon Officer and Combat Engineering Unit Officer, 7th Special Forces Group, Fort Bragg, NC

Professional Affiliations

American Society of Civil Engineers
American Academy of Water Resources Engineers
International Erosion Control Association (IECA – past president)
American Society of Testing and Materials (ASTM)
American Institute of Hydrology (Chair, Board of Registration and Executive Committee Board member)

Honors and Awards

Fellow and Life Member, American Society of Civil Engineers
Founding Diplomate, American Academy of Water Resources Engineers
Hogg-Owen Award for Meritorious Achievement, Floodplain Management Association
Sustained Contributor Award, IECA
Small Business Person of the Year, Chamber of Commerce, Carlsbad, California, 1993
Sustained Superior Performance, USACE
Special Act Award, USACE
U.S. Army Commendation Medal
U.S. Army Commendation Medal with Oak Leaf Cluster

Summary

David T. Williams and Associates (DTW) is a certified MBE, SBE, DBE and Disabled Veteran owned business. Dr. David Williams, the president of DTW, has over 35 years of experience in the water resources industry and is known nationally and internationally for his contributions to the industry. He served as Principal-in-Charge for several FEMA flood insurance studies in San Diego and Orange counties. He has written the new HEC-6 User Manual for the U.S. Corps of Engineers Hydrologic Engineering Center, performed HEC-6 and local scour analysis of pipeline crossings in Arizona and New Mexico, headed the Keene Ranch groundwater modeling study and the Nile River sedimentation evaluations for the World Bank. He is well versed in the computer programs HEC-1, HEC-HMS, HEC-2, HEC-RAS, HEC-6, STORM, and WQRRS. Dr. Williams is also a nationally recognized expert in sedimentation engineering and in developing innovative solutions to difficult hydraulic and hydrologic design problems in rivers and estuaries.

Dr. Williams previously served as a two time President of the International Erosion Control Association. He has served as chair of the ASCE Task Committee on Analysis of Laboratory and Field Sediment Data Accuracy and Availability. He is also a past chair of the ASCE Sedimentation Committee as well as the Computational Hydraulics Committee and currently serves on the ASCE River Restoration Committee. He served as a committee member of ASTM A05.12 (Wire specifications), where he helped develop the standards for both welded and twisted (woven) gabions. He also served on ASTM D18.25 (Erosion Control Products), where he helped develop a variety of standards related to erosion control. While chair of the Federal Interagency Technical Committee on Sedimentation when Dr. Williams was with the U.S. Army Corps of Engineers, he worked with hydraulic and sedimentation experts from the Federal Highway Administration, Bureau of Reclamation, U.S. Geological Survey, Bureau of Land Management, Forest Service, TVA, Bureau of Land Management and the Agricultural Research Service. His work with the Committee involved developing sediment sampling equipment and sediment data collection methods. He is the author of more than 100 technical papers and reports on hydraulics and sedimentation. Dr. Williams was formerly an Associate Editor of the ASCE Journal of Hydraulic Engineering, as well as a reviewer. He was selected the 1993 Small Business Person of the Year by the Carlsbad, California Chamber of Commerce, and served as chair of the Carlsbad Beach Erosion Committee.

His professional experience includes more than eighteen years as a hydraulic engineer with the U.S. Army Corps of Engineers at the Waterways Experiment Station (WES) in Vicksburg, Mississippi, both the Nashville and Baltimore Districts, and the Hydrologic Engineering Center (HEC) in Davis, California. While at WES, Dr. Williams worked on research applications of sediment transport in rivers and reservoirs and the solution of unusual hydraulic and sediment related problems using computer models and other state-of-the-art techniques. He also worked on the development of the cohesive and network versions of the HEC-6 sediment transport computer model and wrote the Reservoir

Sedimentation Chapter in the U.S. Corps of Engineering Manual on Sedimentation Investigations. At the Nashville District, Dr. Williams performed erosion control and sedimentation studies for the Tennessee-Tombigbee Waterway Project and also conducted sedimentation and floodplain information studies of proposed flood control projects. He was acting Chief of the Hydrology and Hydraulics Section at the Baltimore District Corps of Engineers. During the mid 1970's, Dr. Williams worked at HEC, helping in the development of spatial data management techniques, evaluation of the economic benefits of flood control projects, and sedimentation in rivers and reservoirs.

Dr. Williams has been a frequent short course instructor for ASCE, Federal and State Agencies for computer training workshops on using HEC-2, HEC-RAS, HEC-HMS and HEC-6. In addition, he has taught short courses on channel bed scour for toe protection design, sediment transport, bridge scour and streambank protection.

Selected Projects

Expert and Independent Technical Review Panels

Member of 4 Board of Senior Consultants/Safety Assurance Review Panel – The Sacramento Area Flood Control Agency (SAFCA), the West Sacramento Area Flood Control Agency (WSAFCA), and the Three Rivers Levee Improvement Authority (TRLIA) are each upgrading their levee systems in the northern California to the 200 year protection level and the City of Dallas (Trinity River Watershed Protection) to the 100 year flood level. After the devastation brought on by Hurricane Katrina, the U.S. Army Corps of Engineers required that all new or upgraded flood control projects that received federal cost sharing funding are to have an Independent External Technical Review (IETR) comprised of national experts in the appropriate disciplines. In response to this edict, these agencies appointed Dr. Williams as a member of the Board of Senior Consultants (BOSC) for their 4 project to review and provide expert advice on the risk and uncertainty analysis, plan formulations, erosion control, sediment transport analyses, fluvial geomorphology, hydrology and hydraulic aspects of the project.

Member, FEMA’s Scientific Resolution Panel (SRP), Washington DC - The Federal Emergency Management Agency makes available an independent scientific body referred to as the Scientific Resolution Panel (SRP) that can be convened when deemed necessary by FEMA or upon a joint agreement between FEMA and a community. SRPs are independent panels of experts organized, administered, and managed by the National Institute of Building Sciences. They are established for the purpose of reviewing and resolving conflicting scientific and technical data submitted by a community challenging FEMA's proposed flood elevations. Dr. Williams is on a pre-qualified roster of national experts on FEMA regulations and procedures and was recently appointed to a Panel for a dispute in Texas.

NCHRP 24 – 34, Risk Based Approach for Bridge Scour Prediction. For the U.S Department of Transportation, Transportation Research Board, Dr. Williams is on the

technical advisory committee for this research. The project objective is to develop a risk-based methodology that can be used in calculating bridge pier, abutment, and contraction scour at waterway crossings so that scour estimates can be linked to a probability. The developed probabilistic procedures would be consistent with LRFD approaches used by structural and geotechnical engineers.

EPA Selection Panel, Washington D.C. – Dr. Williams has served on 3 EPA selection panels in the areas of climate change, ecological indicators and thresholds. The panel evaluated research proposals from universities and non-profit organizations and made recommendations to EPA on which proposals to approve. The panels were comprised of experts in the engineering and naturals sciences. Dr. Williams was the only private consultant on each panel, which was composed of academic and government personnel.

Flood Control and FEMA Mapping

FEMA Studies of 27 Streams in the Unincorporated Areas of San Diego County, California – Dr. Williams was the principal-in-charge for this project for FEMA. He also took on some of the studies are the project manager. The studies involved over 50 miles of streams using FEMA standards for surveying, hydraulic modeling and floodplain and floodway delineations which and resulted in new and updated FIRM maps.

Approximate Floodplain Study for Orange County, California - Dr. Williams and his team prepared an approximate floodplain study for the Orange County Flood Control District to delineate 100-year floodplains for the East Garden Grove - Wintersburg Channel (C05), the Ocean View Channel (C06), and seven tributaries to the C05 channel. This project was undertaken by the District to facilitate lifting of the Santa Ana River floodplain (zone A99) after the completion of the Santa Ana River flood protection project by the U.S. Army Corps of Engineers (Corps). The Corps project has controlled breakout flows from the Santa Ana River (SAR), but the flooding from other sources underlying the SAR floodplain, needed to be delineated before the A99 zone was lifted by FEMA. The study area is located in the Cities of Huntington Beach, Fountain Valley, Westminster, Santa Ana, Garden Grove, Anaheim, and Orange, in Orange County, California. The C05 and C06 channel system consists of a complex network of leveed channels, storm drains, and detention basins that convey stormwater runoff from highly urbanized low-lying interior areas to the Pacific Ocean. About 16 miles of flood control channels were analyzed using an approximate hydraulic analysis with the Corps HEC-RAS program. The C05 channel laterals were analyzed using various computer programs including the Corps HEC-RAS program and the HEC-2 program with the split-flow option, and the Los Angeles County Flood Control Districts WSPG program. To obtain a model for an approximate level of analysis, all levees, bridges, and culverts, were removed from the cross-sections. Engineering judgment was used to interpret the model results based on output that appeared reasonable in accordance with field observations. Field observations were used to verify flow directions, track flow paths, and evaluate the effect of floodplain features such as elevated highway embankments. Approximate studies in urban environments can be especially challenging because of the need to make

appropriate assumptions in order to simplify complex hydrologic and hydraulic phenomena. A Zone A approximate 100-year floodplain was delineated. The results of the study satisfied FEMA requirements and were subsequently published for the benefit of the community. Dr. Williams was the Project Manager and Principal in Charge.

St. Tammany Flood Control Analysis, U.S. Army Corps of Engineers, New Orleans District, New Orleans, Louisiana - Dr. Williams and his engineers developed a conceptual flood management plan for St. Tammany Parish in southeast Louisiana. Flood management in St. Tammany Parish was a unique challenge, with 100 square miles drained by a complex network of natural bayous and man-made canals. Hydrologic and hydraulic models were needed to evaluate existing conditions and compare flood management alternatives. The results of the hydrologic models provided the input for hydraulic modeling to the New Orleans District Corps of Engineers with useful answers about their proposed flood management plan, allowing the District and the citizens of St. Tammany Parish to make informed decisions about their watershed.

Dam Breach Analyses for San Diego County Water Authority (SDCWA) – As principal in charge, Dr. Williams also acted as the technical advisor for this series of contracts to analyse numerous dam breach projects for SDCWA. This contact involved using the NWS DAMBreak model for FERC re-authorization of existing hydroelectric dams as well as for scenarios of raising dams to obtain additional storage and power. The results, which included numerous breach scenarios, output hydrographs and resulting inundation areas for FEMA flood mapping, were used to create new or revise Emergency Action Plans.

Hydraulics and Hydrology

Reservoir Sedimentation Analysis for FERC relicensing, Alcoa Power Generating Inc. – Dr. Williams was in charge of this reservoir sedimentation study for the High Rock Dam in North Carolina. The client needed this information for the application for relicensing of the dam. The sediment transport model was used to evaluate the effects of the dam on sedimentation that had a potential to adversely affect adjacent infrastructure.

Examination of Hydraulic Rollers at Run of the River Dams, Illinios Dept. of Natural Resources, Springfield, IL – As technical advisor to this project, Dr. Williams provided technical guidance in developing solutions to the hydraulic roller problem at the downstream portion of the weir at Geneva Dam. The temporary solution was the placement of rock riprap at this location and its design based upon high turbulence conditions.

Eastern Arkansas Water Supply Study - Study included extensive model application and model calibration to analyze the effect of in-basin water transfers on surface water flow magnitude, frequency, and duration in the La Grue Bayou stream network using Corps of Engineers' programs HEC-1, HEC-2, HEC-DSS, and HEC-FFA. A unique feature to this study was the application of the Memphis District's program HUXRAIN to develop long

term (50 years) synthetic discharge hydrographs using calibrated antecedent precipitation index coefficients, a long term rainfall data base, and computed unit hydrographs for the sub-basins. Another component of this work was an interior hydrology study for the city of Clarendon, Arkansas. Several scenarios were analyzed using HEC-IFH for continuous simulation with 50 years of data.

IDIQ for Los Angeles District Corps of Engineers - During this IDIQ contract for hydrology and hydraulics with the Los Angeles District, Dr. Williams and his team completed multiple work orders. A spillway inundation study was conducted for Carbon Canyon simulating dam break using HEC-RAS. A two-dimensional link node model was applied to Mission Creek in Santa Barbara to evaluate flooding due to overspilling of the channels to lower elevations and connector streams. In the Santa Margarita river watershed study, HEC-1, HEC-2 and HEC-6 were used to evaluate flooding extents and sedimentation problems in the river. Two channel restoration and environmental enhancement plans were developed in Phoenix area for the Tres Rios and Rio Salado projects. Tres Rios involved HEC-6 modeling and Rio Salado had both HEC-RAS and HEC-6 models developed for the Salt River. A major flood map revision study and levee analysis report was conducted for the Los Angeles River and Compton Creek, resulting in hundreds of thousands people taken out of the 100 year regulatory floodplain. During this study, numerous HEC-2 models were modified to reflect levee system changes made by the Los Angeles District. Overbank models were also modified to analyze split flow conditions.

Lindo Lake Park Water Quality Study, Lakeside, California - Dr. Williams conducted detailed study of water quality conditions, to evaluate lake rehabilitation alternatives, and to develop a restoration plan to improve water quality conditions and to support a wide array of beneficial uses, including active recreation for Lindo Lake Park. Lindo Lake Park Water Quality Study. The Lindo Lake Park Water Quality Study was comprised of five major tasks: 1) public meetings; 2) report on inventory, bibliography and proposed methodology; 3) Quality Assurance Project Plan according to EPA guidelines; 4) Water quality study and associated technical report; and 5) Implementation plan.

Minnesota and Red River CWMS Watershed Modeling, U.S. Army Corps of Engineers, St. Paul District - To establish a flood forecasting system and reduce future flood damage in the Red River of the North basin (4,010 square miles) and Minnesota River basin (1,770 square miles), Dr. Williams, along with his staff and the U.S. Army Corps of Engineers, St. Paul District (the Corps), developed a Corps Water Management System (CWMS) model to assist in real time operation of the reservoirs to regulate reservoir outflows. Dr. Williams' team developed snow process, hydrologic, water control, and hydraulic models that will be incorporated by the Corps into CWMS as model components. The modeling work included development, calibration, and verification of the Distributed Snow Process Model (DSPM), HEC-HMS, HEC-ResSim, and HEC-RAS models.

Wellhead Protection Plan for the Los Angeles Corps of Engineers, Planning Division, San Luis, Arizona - The components included the delineation of wellhead protection

areas, the compilation of a contaminant source inventory, the development of management tools to protect the groundwater and the formulation of a contingency plan for both short and long term losses of one or more wells.

Two-Dimensional Study of the Missouri River, Chamois Reach, USACE, Kansas City District IDC - Dr. Williams was Principal in Charge for a 2-D study of the Missouri River called the Chamois reach between RM 116.5 and RM 113.5. The model used was RMA2, which is a part of the WMS system. It was used to identify low and medium flow habitat areas and the depths and velocities associated with those areas. The results were used to determine opportunities for habitat enhancements.

West Tennessee Tributaries Project Limited Evaluation Study, Tennessee - A reconnaissance level analysis was conducted to evaluate the proposed restoration of old river meanders that were cut off from the Middle Fork Forked Deer River by historical channelization projects. This study included an extensive combination of hydrological, hydraulic, and sediment transport simulations, using historical rainfall and runoff records, current field data, and calibration to 1960 and 1979 channel geometry survey data. In addition to Corps of Engineers' programs HEC-1, HEC-2, HEC-DSS, HEC-FFA, and HUXRAIN for surface water flow modeling and standard computer program HEC-6 for sediment transport analysis, the newer HEC-6T, "Sedimentation in Stream Networks", developed by William A. (Tony) Thomas, was used to evaluate the sediment transport of flow converging and diverging at the junctions of the main channel and the old meanders. A sediment-weighted histogram generator modified by WEST Consultants was used to generate the hydrology input for the HEC-6 programs. Designs for rock riprap diversion weirs and bridge protection, and an in-line sediment trap were developed in this study.

White River Unsteady Flow Model, Arkansas - An unsteady flow model using the computer program UNET was developed for 70 miles of the White River in eastern Arkansas. Model parameters were calibrated to historical stage and flow records before executing two 47 year simulations. Simulations were run for existing conditions and conditions after installation of an inlet canal and pumping station for an irrigation scheme. Results were provided to the District to help them evaluate effects of the irrigation project on the river. A second part of this project involved evaluation of the irrigation canals for sediment transport and scour/deposition. The computer program SAM was used to help determine stable channel parameters and the amount of scour/deposition that could be expected with the District's design geometry and slope.

Expert Testimony and Support

Expert Consultant: Flooding of property by US Army Corps of Engineers, Missouri, for private party

Expert Consultant: Stream restoration design and construction defects, North Carolina, for private party

Expert Testimony: Flooding death, for Metropolitan St. Louis Sewer District

Expert Testimony: Gabion technical claims dispute, for Terra Aqua Gabions

Expert Consultant: Subdivision Flooding, for City of Reno, NV

Expert Consultant: Analysis of Milltown Dam Removal and Potential Deposition at Thompson Falls Reservoir, Montana, for Pennsylvania Power and Light

Expert Consultant: FERC relicensing, North Carolina, for Alcoa Power Generating Corporation

Expert Consultant: Scour Evaluation of Grading Plan Changes for Cyrus Wash, for Kern County, CA

Expert Consultant: Baker River FERC relicensing, WA, for Puget Sound Energy

Expert Consultant: Blackfoot and Clark Fork River Restoration Plan, Montana for unnamed client

Expert Consultant: Agua Fria River Streambank Scour Analyses, Phoenix, AZ, for Flood Control District of Maricopa Co., AZ

Expert Consultant: Erosion and Drainage, Newport Beach, California, for private client

Expert Consultant: Subdivision Flooding Problems and Floodplain Mapping Procedures, Dayton, Ohio, for private client

Expert Consultant: Flooding Problems, Unnamed creek, Los Angeles, California, for private client

Expert Testimony: Murrieta Creek Flooding, Riverside County, California, for Riverside Co. Flood Control District

Expert Testimony: Flooding Potential and Analysis of Coconut Grove, Kailua, Oahu, Hawaii, for private client

Expert Consultant: Subdivision Flooding Problems, Waialae Iki V, Oahu, Hawaii, for private client

Expert Testimony: Flood Problems at Carlton Oaks Country Club, Santee, California, for private client

Expert Consultant: Alpine Mobile Home Park Flooding, Alpine, California, for private client

Expert Consultant: River Effects of Sand Mining Operations, San Luis Rey River, California, for private client

Expert Testimony: Pecos Road Pipeline Scour, Phoenix, Arizona, for El Paso Natural Gas Company

Expert Consultant: San Diego Creek Revetment Failure, Irvine, California, for private client

Expert Consultant: San Luis Obispo Creek Flooding, San Luis Obispo, California, for private client

Expert Consultant: Kern River Ordinary Highwater Litigation, Bakersfield, California, for private client

Misc. Floodplain Hydraulics and Flood Protection

Reconnaissance Study Report and Project Management Plan for the Tijuana River Watershed Study – USACE, Los Angeles District

Spillway, Outlet, and Stilling Basin Design for Reelfoot Lake Sedimentation Basin – USACE, Memphis District
FEMA Studies of River System near Huntington Beach, Orange County, California
River System Studies near Huntington Beach for Orange County for Submittal to FEMA, Orange County, California
FEMA Studies of 27 Streams in the Unincorporated Areas of San Diego County, California
Hydraulic Analysis and Levee Elevation Design of West Williamson, West Virginia, Flood Control Project, for USACE, Huntington District
Flood Information Study of Pineville, Kentucky, for USACE, Nashville District
Murrieta Creek Flood Control and Environmental Restoration Project – USACE, Los Angeles District
Hydraulic Design of Supercritical and Subcritical Flood Control Channels for the Rio Puerto Nuevo Flood Control Project, San Juan, Puerto Rico, for USACE, Jacksonville District
Flood Control Channel Design, Buena Vista Creek, Vista, California, City of Vista, CA
Forest Falls Community Flood Warning System – USACE, Los Angeles District

Publications (abbreviated)

Professional Papers

Wu, Weiming, Williams, David T., et.al, "Earthen Embankment Breaching, "Earthen Embankment Breaching," *J. Hydraul. Eng.*, 137(12), 1549–1564, 2011

Williams, David T,. and Stedinger, Jey R., "Practical Applications of Risk & Uncertainty Theory in Water Resources: Shortcuts Taken and Their Possible Effects," *Proceedings*, World Environmental & Water Resources Congress 2011, Environmental & Water Resources Institute, ASCE, Palm Springs, CA, May 22 - 26, 2011

Yescas, Alex, Norman, Kirk, Williams, David T.,"Bank Stabilization by Redirective Structures on the Santa Clara River, Ventura Co., CA," *Proceedings*, World Environmental & Water Resources Congress 2011, Environmental & Water Resources Institute, ASCE, Palm Springs, CA, May 22 - 26, 2011

Williams, David T., Harder, Leslie, Jr., Sills, George, and Martin, Ray, "The Value Added to Flood Control Projects By Use of External Review Panels," *Proceedings*, World Environmental & Water Resources Congress 2010, Environmental & Water Resources Institute, ASCE, Providence, RI, May 16 - 20, 2010

Depue, Michael, Williams, David T., and Esterson, Kris, "Planning for Climate Change in the Technical Analysis of Floodplain Mapping and Flood Control Projects," Association of State Floodplain Managers Conference, Orlando, FL, June 2009

Su, Yu-Chun, Wobig, Loren, Winters, Brad, He, Xin, and Williams, David T., "The Geneva Dam, IL Hydraulic Roller Problem: Design of a Temporary Steep Riprap Ramp," *Proceedings*, World Environmental and Water Resources Congress 2009, Kansas City, MO

Williams, David T., and Countryman, Joseph, "Uncertainty Analysis: You Need to Know What You Don't Know," *Proceedings*, World Environmental and Water Resources Congress 2009, Kansas City, MO

McEvoy, Donald M., and Williams, David T., "Proposed Procedures in Utilizing Risk and Uncertainty Principles in Floodplain Management and Mapping," *Proceedings*, Association of State Floodplain Managers Conference, Reno, 2008.

Philips, Bruce M., and Williams, David T., "Design Considerations for Confining and Guiding Levees on Alluvial Fans," *Proceedings*, World Environmental and Water Resources Congress 2008, Honolulu, Hawaii, May 12–16, 2008.

Kreymborg, Leo, R., and Williams, David T., "The PBS&J Scour Spreadsheet: A Tool for Stream Restoration, Utility Crossings and Streambank Protection Projects," *Proceedings*, World Environmental and Water Resources Congress 2008, Honolulu, Hawaii, May 12–16, 2008.

Williams, David T., "Tips on Using the Dambreak Option in HEC-RAS," *Proceedings*, Arid Regions and CASFM Conference, Breckenridge, CO, 2007.

Williams, David T., and Houghland, Sarah, "Alluvial Fan Management and Analysis: Methods used in the State of Colorado," *Proceedings*, Arid Regions and CASFM Conference, Breckenridge, CO, 2007.

Williams, David T., "So You Have Been Asked to Be an Expert Witness? Now What?" Floodplain Managers Association Annual Conference, San Diego, CA, Sept., 2008

Thomas, Iwan M., and Williams, David T., "Common Modeling Mistakes Using HEC-RAS," Proceedings, World Environmental and Water Resources Congress 2007: Restoring our Natural Habitat, Tampa, Florida, May 15–19, 2007.

Kreymborg, Leo R., Williams, David T and Thomas, Iwan M., "Rapid Floodplain Delineation," Proceedings, World Environmental and Water Resources Congress 2007: Restoring our Natural Habitat, Tampa, Florida, May 15–19, 2007.

Williams, David T., "Finessing 1-D Hydraulic Models into 2-D Performance," Proceedings, World Environmental and Water Resources Congress 2007: Restoring Our Natural Habitat, Tampa, Florida, May 15–19, 2007.

Williams, David T., Marcy, Jennifer K., and DePue, Michael, "FEMA Levee Analysis Requirements for Floodplain Mapping," Proceedings, Association of State Floodplain Managers Conference, Norfolk, VA, 2007.

Desai, Harshal, Baird, Matt, and Williams, David T., "2-D Floodplain Hydraulic Modeling using 1-D Hydraulic Models," Proceedings, Association of State Floodplain Managers Conference, Norfolk, VA, 2007.

Williams, David T., and Kreymborg, Leo R., "Are You Double Counting, Over Conservative, or Misapplying Safety Factors for Stream Scour Analyses?" Floodplain Management Association Annual Conference, Coronado, CA, September 5-8, 2006

Williams, David T., and Doeing, Brian J., "Variation in Depth of Toe Scour Computations For Stream Restoration Bank Protection Design," Proceedings, International Erosion Control Annual Conference and Exposition, Las Vegas, NV, February 24-28, 2003.

Williams, David T., Gusman, A. Jake., and Teal, Martin J., "Proposed Methodology for Floodway Determination Using Unsteady Flow in HEC-RAS," Proceedings, ASFPM Conference, Biloxi, MS, June 23-28, 2003.

Williams, David T., Hu, Henry H., and Stefanovic, Dragoslav, "Sediment Flushing From a Flood Control Channel Outlet Into the Pacific Ocean", Proceedings, EWRI 2002 Conference on Water Resources Planning and Management, Symposium on Managing the Extremes: Floods and Droughts, First Symposium on Environmental and Water Resources Systems Analysis, Roanoke, Virginia, May 19-22, 2002.

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Williams, David T., Hu, Henry H., Doeing, Brian J., and Phillips, Craig, "Headcut Analysis Due to Overbank Sand and Gravel Mining." Proceedings, Floodplain Management Association 21st Semi-Annual Conference, Lake Tahoe, NV, September 23-26, 2001.

Stefanovic, Dragoslav, Williams, David T., "Two-Dimensional-Vertical Numerical Modeling of Stratified Environments", Proceedings, World Water and Environmental Resources Congress Conference, Orlando, Florida, May 20-24, 2001.

Williams, David T., Teal, Martin J., and Bradley, Jeffrey B., "Use of GIS and Regional Relationships to Determine Subbasin Sediment Yields for Input to a Sediment Transport Model", Invited paper, Proceedings, ASAE International Symposium, Honolulu, Hawaii, January 3-5, 2001

Williams, David T., and Teal, Martin J., "Between A Rock And A Soft Place: Which Riprap Method Should I Use for My Project?" Proceedings, ASCE and EWRI 2000 Joint Conference On Water Resources Engineering and Water Resources Planning & Management, Minneapolis, MN, July 30-Aug 2, 2000.

Teal, Martin J., Schulte, Marc A., Williams, David T. and Remus, John I., "Sediment Modeling of Big Bend Reservoir, South Dakota", Proceedings, ASCE and EWRI 2000 Joint Conference On Water Resources Engineering and Water Resources Planning & Management, Minneapolis, MN, July 30-Aug 2, 2000.

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Forman, Selena M., Williams, David T., and Remus, John I., "Development of Methodology to Reduce Suspended Sediment Sample Collection on the Missouri River at Sioux City, Iowa", Proceedings, ASCE and EWRI 2000 Joint Conference On Water Resources Engineering and Water Resources Planning & Management, Minneapolis, MN, July 30-Aug 2, 2000.

Chintala, Ramesh S., Williams, David T., Allen, Peter M., "Channel Response and Sediment Yields in Brookeen Creek, Central Texas", Proceedings of the International Erosion Control Association (IECA) Conference, Palm Springs, California, 2000

Doeing, Brian J. and Williams, David T., "Development, Calibration, Confirmation, Project Production Runs and Sensitivity Analyses of One Dimensional Sediment Transport Models", Proceedings, ASCE and EWRI 2000 Joint Conference On Water Resources Engineering and Water Resources Planning & Management, Minneapolis, MN, July 30-Aug 2, 2000.

BI/COI FORM 3

The National Academies of
SCIENCES · ENGINEERING · MEDICINE

BACKGROUND INFORMATION AND CONFIDENTIAL CONFLICT OF INTEREST DISCLOSURE

For General Scientific and Technical Studies and Assistance

NAME	**David T. Williams, Ph.D., P.E.**
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ADDRESS	DTW and Associates, Engineers, LLC 1112 Oakridge Dr., Suite 104, PMB 236 Fort Collins, CO 80524
EMAIL	David@dtwassoc.com
CURRENT EMPLOYER	DTW and Associates, Engineers, LLC
COMMITTEE	River Islands at Lathrop Phase 2B Project, USACE 33 USC 408 Safety Assurance Review Panel

There are two parts to this form, Part I Background Information, and Part II Confidential Conflict of Interest Disclosure. Complete both parts, **sign** and **date** this form on the last page, and return the form to the responsible staff officer for the project and committee activity to which this form applies. **Retain a copy for your records**.

PART I **BACKGROUND INFORMATION**

INSTRUCTIONS

Please provide the information requested below regarding **relevant** organizational affiliations, government service, public statements and positions, research support, and additional information (if any). Information is "relevant" if it is related to -- and might reasonably be of interest to others concerning -- your knowledge, experience, and personal perspectives regarding the subject matter and issues to be addressed by the committee activity for which this form is being prepared. If some or all of the requested information is contained in your curriculum vitae, you may if you prefer simply attach your CV to this form, supplemented by additional responses or comments below as necessary.

I. ORGANIZATIONAL AFFILIATIONS. Report your relevant business relationships (as an employee, owner, officer, director, consultant, etc.) and your relevant remunerated or volunteer non-business relationships (e.g., professional organizations, trade associations, public interest or civic groups, etc.).

See attached resume.

II. GOVERNMENT SERVICE. Report your relevant service (full-time or part-time) with federal, state, or local government in the United States (including elected or appointed positions, employment, advisory board memberships, military service, etc.).

See attached resume.

III. RESEARCH SUPPORT. Report relevant information regarding both public and private sources of research support (other than your present employer), including sources of funding, equipment, facilities, etc.

No research support.

IV. PUBLIC STATEMENTS AND POSITIONS. List your relevant articles, testimony, speeches, etc., by date, title, and publication (if any) in which they appeared, or provide relevant representative examples if numerous. Provide a brief description of relevant positions of any organizations or groups with which you are closely identified or associated.

See attached resume.

V. ADDITIONAL INFORMATION. If there are relevant aspects of your background or present circumstances not addressed above that might reasonably be construed by others as affecting your judgment in matters within the assigned task of the committee or panel

on which you have been invited to serve, and therefore might constitute an actual or potential source of bias, please describe them briefly.

All information has been provided

PART II **CONFIDENTIAL CONFLICT OF INTEREST DISCLOSURE**

INSTRUCTIONS

It is essential that the work of committees of the institution used in the development of reports not be compromised by any significant conflict of interest. For this purpose, **the term "conflict of interest" means any financial or other interest which conflicts with the service of the individual because it (1) could significantly impair the individual's objectivity or (2) could create an unfair competitive advantage for any person or organization.** Except for those situations in which the institution determines that a conflict of interest is unavoidable and promptly and publicly discloses the conflict of interest, no individual can be appointed to serve (or continue to serve) on a committee of the institution used in the development of reports if the individual has a conflict of interest that is relevant to the functions to be performed.

The term "conflict of interest" means something more than individual bias. There must be an *interest,* ordinarily financial, that could be directly affected by the work of the committee.

Conflict of interest requirements are *objective* and *prophylactic.* They are not an assessment of one's actual behavior or character, one's ability to act objectively despite the conflicting interest, or one's relative insensitivity to particular dollar amounts of specific assets because of one's personal wealth. Conflict of interest requirements are objective standards designed to eliminate certain specific, potentially compromising situations from arising, and thereby to protect the individual, the other members of the committee, the institution, and the public interest. The individual, the committee, and the institution should not be placed in a situation where others could reasonably question, and perhaps discount or dismiss, the work of the committee simply because of the existence of conflicting interests.

The term "conflict of interest" applies only to *current interests.* It does not apply to past interests that have expired, no longer exist, and cannot reasonably affect current behavior. Nor does it apply to possible interests that may arise in the future but do not currently exist, because such future interests are inherently speculative and uncertain. For example, a pending formal or informal application for a particular job is a current interest, but the mere possibility that one might apply for such a job in the future is <u>not</u> a current interest.

The term "conflict of interest" applies not only to the personal interests of the individual but also to the *interests of others* with whom the individual has substantial common financial interests if these interests are relevant to the functions to be performed. Thus, in assessing an individual's potential conflicts of interest, consideration must be given not only to the interests of the individual but also to the interests of the individual's spouse and minor children, the individual's employer, the individual's business partners, and others with whom the individual has substantial common financial interests. Consideration must also be given to the interests of those for whom one is acting in a

fiduciary or similar capacity (e.g., being an officer or director of a corporation, whether profit or nonprofit, or serving as a trustee).

Much of the work of this institution involves scientific and technical studies and assistance for sponsors across a broad range of activities. Such activities may include, for example: defining research needs, priorities, opportunities and agendas; assessing technology development issues and opportunities; addressing questions of human health promotion and assessment; providing scientific and technical assistance and supporting services for government agency program development; assessing the state of scientific or technical knowledge on particular subjects and in particular fields; providing international and foreign country science and technology assessments, studies and assistance. Such activities frequently address scientific, technical, and policy issues that are sufficiently broad in scope that they do not implicate specific financial interests or conflict of interest concerns.

However, where such activities address more specific issues having significant financial implications -- e.g., funding telescope A versus telescope B, government development or evaluation of a specific proprietary technology, promotion or endorsement of a specific form of medical treatment or medical device, connecting foreign research facilities to specific commercial interests, making recommendations to sponsors regarding specific contract or grant awards, etc. -- careful consideration must be given to possible conflict of interest issues with respect to the appointment of members of committees that will be used by the institution in the development of reports to be provided by the institution to sponsoring agencies.

The overriding objective of the conflict of interest inquiry in each case is to identify whether there are interests – primarily financial in nature – that conflict with the committee service of the individual because they could impair the individual's objectivity or could create an unfair competitive advantage for any person or organization. The fundamental question in each case is does the individual, or others with whom the individual has substantial common financial interests, have identifiable interests that could be directly affected by the outcome of the project activities of the committee on which the individual has been invited to serve? For projects involving advice regarding awards of contracts, grants, fellowships, etc., this institution is also guided by the principle that an individual should not participate in any decision regarding the award of a contract or grant or any other substantial economic benefit to the individual or to others with whom the individual has substantial common financial interests or a substantial personal or professional relationship.

The application of these concepts to specific scientific and technical studies and assistance projects must necessarily be addressed in each case on the basis of the particular facts and circumstances involved. The questions set forth below are designed to elicit information from you concerning possible conflicts of interest that are relevant to the functions to be performed by the particular committee on which you have been invited to serve.

1. FINANCIAL INTERESTS. (a) Taking into account stocks, bonds, and other financial instruments and investments including partnerships (but excluding broadly diversified mutual funds and any investment or financial interests valued at less than $10,000), do you or, to the best of your knowledge others with whom you have substantial common financial interests, have financial investments that could be affected, either directly or by a direct effect on the business enterprise or activities underlying the investments, by the outcome of the project activities of the committee on which you have been invited to serve?

(b) Taking into account real estate and other tangible property interests, as well as intellectual property (patents, copyrights, etc.) interests, do you or, to the best of your knowledge others with whom you have substantial common financial interests, have property interests that could be directly affected by the outcome of the project activities of the committee on which you have been invited to serve?

(c) Could your employment or self-employment (or the employment or self-employment of your spouse), or the financial interests of your employer or clients (or the financial interests of your spouse's employer or clients) be directly affected by the outcome of the project activities of the committee on which you have been invited to serve?

(d) Taking into account research funding and other research support (e.g., equipment, facilities, industry partnerships, research assistants and other research personnel, etc.), could your current research funding and support (or that of your close research colleagues and collaborators) be directly affected by the outcome of the project activities of the committee on which you have been invited to serve?

(e) Could your service on the committee on which you have been invited to serve create a specific financial or commercial competitive advantage for you or others with whom you have substantial common financial interests?

If the answer to all of the above questions under FINANCIAL INTERESTS is either "no" or "not applicable," check here _X____ (NO).

If the answer to any of the above questions under FINANCIAL INTERESTS is "yes," check here ____ (YES), and briefly describe the circumstances on the last page of this form.

Not applicable

2. OTHER INTERESTS. (a) Is the central purpose of the project for which this disclosure form is being prepared a critical review and evaluation of your own work or that of your employer?

(b) Do you have any existing professional obligations (e.g., as an officer of a scientific or engineering society) that effectively require you to publicly defend a previously established position on an issue that is relevant to the functions to be performed in this committee activity?
(c) To the best of your knowledge, will your participation in this committee activity enable you to obtain access to a competitor's or potential competitor's confidential proprietary information?

(d) If you are or have ever been a U.S. Government employee (either civilian or military), to the best of your knowledge are there any federal conflict of interest restrictions that may be applicable to your service in connection with this committee activity?

(e) If you are a U.S. Government employee, are you currently employed by a federal agency that is sponsoring this project? If you are not a U.S. Government employee, are you an employee of any other sponsor (e.g., a private foundation) of this project?

(f) If the committee activity for which this form is being prepared involves reviews of specific applications and proposals for contract, grant, fellowship, etc. awards to be made by sponsors, do you or others with whom you have substantial common financial interests, or a familial or substantial professional relationship, have an interest in receiving or being considered for awards that are currently the subject of the review being conducted by this committee?

(g) If the committee activity for which this form is being prepared involves developing requests for proposals, work statements, and/or specifications, etc., are you interested in seeking an award under the program for which the committee on which you have been invited to serve is developing the request for proposals, work statement, and/or specifications -- or, are you employed in any capacity by, or do you have a financial interest in or other economic relationship with, any person or organization that to the best of your knowledge is interested in seeking an award under this program?

If the answer to all of the above questions under OTHER INTERESTS is either "no" or "not applicable," check here __X___ (NO).

If the answer to any of the above questions under OTHER INTERESTS is "yes," check here ____ (YES), and briefly describe the circumstances on the last page of this form.

EXPLANATION OF "YES" RESPONSES:

Not applicable

During your period of service in connection with the activity for which this form is being completed, any changes in the information reported, or any new information, which needs to be reported, should be reported promptly by written or electronic communication to the responsible staff officer.

David T. Williams

SIGNATURE

August 2, 2016
DATE

Reviewed by: _____
Executive Director

_____
Date

ATTACHMENT 4: RP FROM REQUESTER

Design Team Members

NAME/TITLE	ORGANIZATION	EMAIL/PHONE
Josef Tootle / *Geotechnical Design Lead*	ENGEO	jtootle@engeo.com 17278 Golden Valley Parkway Lathrop, CA 95330 Phone: (209) 835-0610
John Zhang / *Civil Engineering Design Lead*	O'Dell Engineering	jzhang@odellengineering.com 1165 Scenic Drive, Suite B Modesto, CA 95350 Phone: (209) 571-1765

QC Reviewers

NAME/TITLE	ORGANIZATION	EMAIL/PHONE
Zachary Crawford / *Quality Assurance Manager*	ENGEO	zcrawford@engeo.com 17278 Golden Valley Parkway Lathrop, CA 95330 Phone: (209) 835-0610

Type II Independent External Peer Review (IEPR) Panel

DISCIPLINE	NAME	DESCRIPTION OF CREDENTIALS
IEPR Lead	Ray Costa	See SAR Plan
Hydrology and Hydraulics	David Williams	See SAR Plan
Geotechnical Engineering	Les harder, Ray Costa	See SAR Plan
Civil Engineering	All IEPR Panel Members	See SAR Plan
Construction	Ray Costa	See SAR Plan

QUALITY ASSURANCE PLAN

RECLAMATION DISTRICT NO. 2062
PHASE II LEVEES
LATHROP, CALIFORNIA

Submitted to:
Ms. Susan Dell'Osso
Reclamation District No. 2062
73 Stewart Road
Lathrop, CA 95330

Prepared by:
ENGEO Incorporated

October 4, 2016

Project No:
5044.000.001

Project No.
5044.000.001

October 4, 2016

Ms. Susan Dell'Osso
Reclamation District No. 2062
73 Stuart Road
Lathrop, CA 95330

Subject: Phase II Levees
River Islands
Lathrop, California

QUALITY ASSURANCE PLAN

Dear Ms. Dell'Osso:

ENGEO prepared this Quality Assurance Plan for the Reclamation District No. 2062 (RD 2062) Phase II Levees at the River Islands project in Lathrop, California. The intent of this report is to summarize the quality control and quality assurance measures to be implemented during construction of the project improvements.

If you have any questions or comments regarding this report, please call and we will be glad to discuss them with you.

Sincerely,

ENGEO Incorporated

Abram Magel, PE

Josef Tootle, GE

REGISTERED PROFESSIONAL ENGINEER
JOSEF TOOTLE
No. 2677
GEOTECHNICAL
STATE OF CALIFORNIA

Zachary Crawford, CEG

PROFESSIONAL GEOLOGIST
ZACHARY A. CRAWFORD
No. 2523
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

am/jt/jf

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1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The overall River Islands project is an approximately 4,800-acre site proposed for residential, commercial, recreational and educational development. The overall River Islands Project is located on Stewart Tract in the southwestern portion of Lathrop, just south of the San Joaquin and Old Rivers; northeast of Paradise Cut; and north of the Union Pacific Railroad.

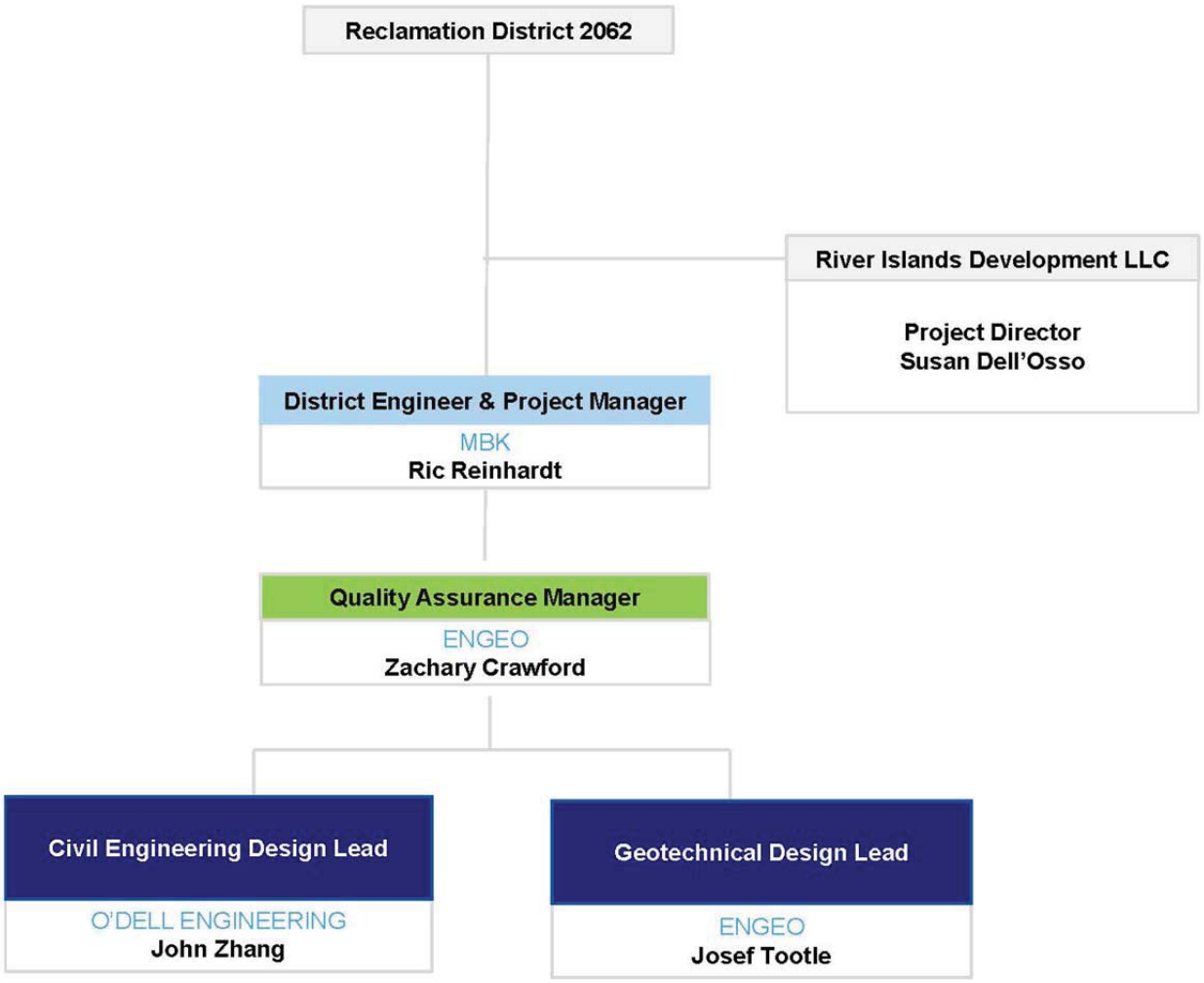
Phase 2 of the project is bound by Old River to the north and Paradise Cut to the west and south. RD-2062 currently operates and maintains levees surrounding the project along Old River and Paradise Cut as well as a recently constructed dry land interior levee on the east side of Phase 2. A new setback levee adjacent to Paradise Cut and reconstruction of the levee adjacent to Old River are proposed to protect the property against flooding. In addition, a setback levee adjacent to RD-2107 is proposed south of the project to improve hydraulic characteristics of the Paradise Cut channel.

1.2 PURPOSE

The purpose of the Quality Assurance Plan (QAP) is to outline the quality control (QC) standards and quality assurance (QA) methods to be implemented during engineering and construction of the River Islands Phase II levee improvements. The QAP dictates the processes and controls necessary to achieve specified quality. The plan outlines how checks and reviews will be completed throughout the project to verify the legitimacy, applicability, and/or accuracy of design criteria, engineering assumptions, support data, calculations, and results. The plan also identifies who is responsible for QA/QC and how the QA/QC process will be documented.

2.0 QUALITY ASSURANCE MANAGEMENT STRUCTURE

The focus of the quality assurance management structure is to put in place the appropriate staff with the correct training and procedures from the inception of the project through completion. An organizational chart showing the lines of authority and reporting relationships of the persons involved in QA/QC is provided below.



2.1 INTERNAL TEAM

We summarize key members of the QA/QC team and their roles below.

2.1.1 Project Manager

The project manager is responsible for reviewing all deliverables that have been through the QC process and will insure that all comments from the internal review process and external governing agencies are addressed. The project manager is responsible for ensuring that final reports are written using clear and concise language.

2.1.2 QA Manager

The QA manager is responsible for verifying and enforcing that the QC requirements are followed. The QA manager communicates with the technical leads, collects QC records, and documents review comments and responses in a QA/QC tracking spreadsheet.

2.1.3 Technical Leads

The technical leads are responsible for confirming that a QC checker has reviewed work products before review from the project manager or external reviewers. The technical leads will perform backchecks to verify that the QC process has been performed and all review comments have been responded to and closed out for each deliverable. The technical lead is responsible for assigning personnel to respond to review comments.

2.1.4 QC Checker

The QC checker is responsible for reviewing and checking technical work products such as calculations, spreadsheets, drawings, logs, report, etc. as they are developed and upon completion. A QC checker will be assigned for each technical task and will work directly with the author(s) of the work product being reviewed. The QC checker, at a minimum, will determine whether:

- Deliverables are consistent with the project scope
- Calculations are organized in a clear and concise manner
- Assumptions are checked to be valid and reasonable
- Results are accurate and meaningful

2.2 EXTERNAL REVIEW

Key project deliverables will be submitted for external review by governing agencies. Each external review will require documented review comments, response to those comments, verification by the reviewer (back-check) that the appropriate actions have been taken, and closure of the comments. Governing agencies may include:

- United States Army Corps of Engineers (USACE)
- Central Valley Flood Protection Board (CVFPB)
- Federal Emergency Management Agency (FEMA)

3.0 PROJECT DELIVERABLES

The types of work products and project deliverables that will be submitted for QA/QC review are listed below:

- Exploration Work Plans
- Geotechnical Data Reports
- Design Criteria
- Alternatives Evaluations
- Seepage and Slope Stability Analyses
- Basis of Design Report

- Plans (65%, 90%, and final), Specifications, and Estimates
- Documentation for FEMA Section 65.10 levee certification

4.0 QUALITY ASSURANCE GUIDELINES AND PROCEDURES

4.1 GUIDELINES

The following QC guidelines are established with the intent to verify that project deliverables and work products are clear and accurate, fulfill the scope of work, and meet or exceed design standards.

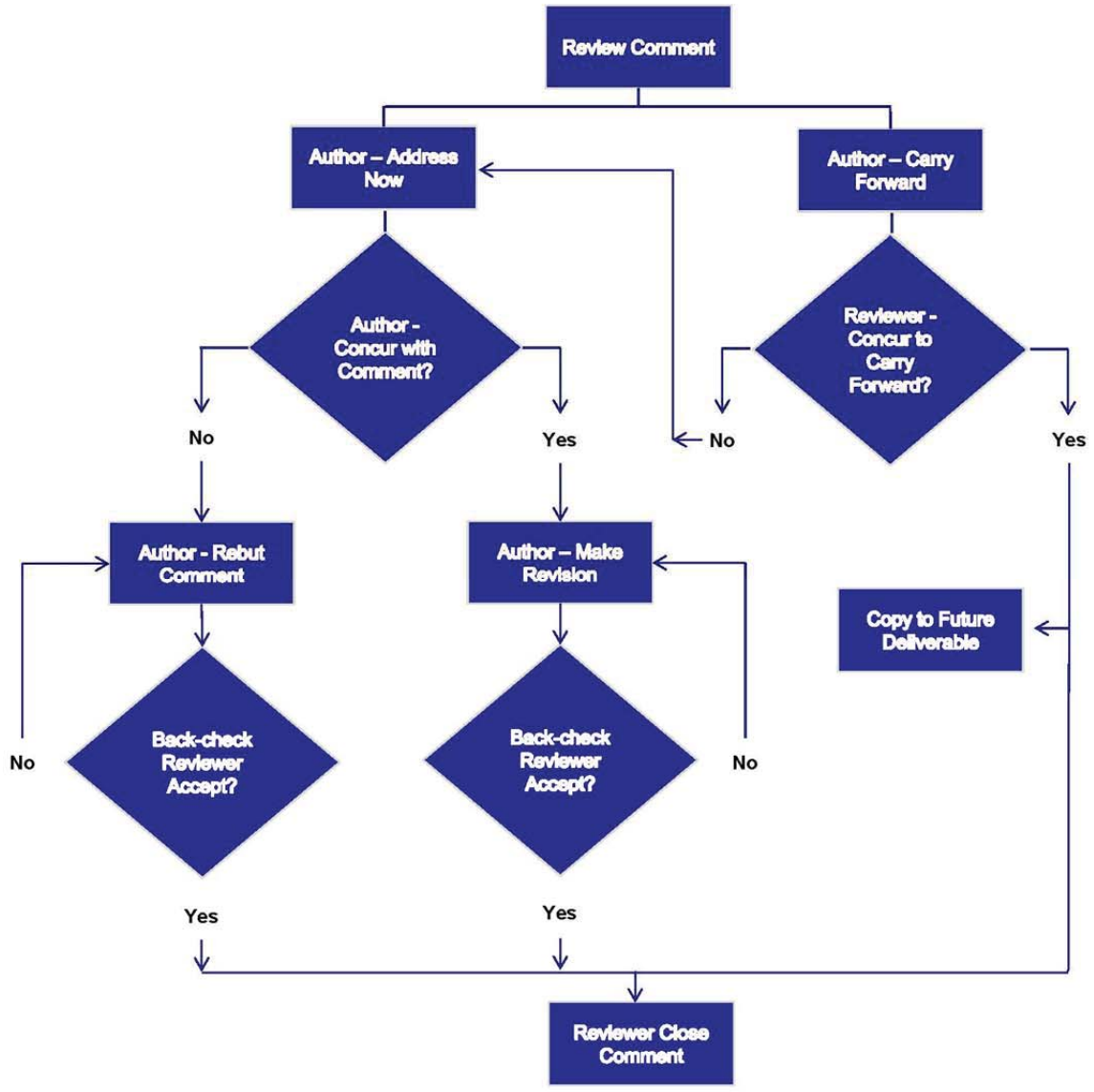
- Compliance with project scope of work
- Compliance with State and Federal design standards, criteria and codes
- Compliance with the industry's current standard of practice
- Reasonableness of assumptions
- Consideration of appropriate alternative methods and strategies
- Applicability and accuracy of exploration and laboratory data
- Thoroughness of engineering analyses
- Accuracy of calculations and results
- Clarity of presentation

4.2 PROCEDURES

Prior to finalization, all project deliverables will undergo QC checks and reviews by the project team. Experienced personnel who were not directly involved in the production of the deliverable will conduct QC checks and reviews. QC reviewers will be project team members with intimate knowledge of the project scope and objectives, as well as the other QC guidelines described in Section 4.1. In addition to internal QC by the project team, external QC will be provided by the governing agencies. Following the completion of the external review, the technical leads will discuss the review comments with the project team to ensure a clear understanding of the review comments and to discuss potential responses and/or modifications. Once the appropriate response is determined, the technical lead will assign personnel to implement the corrective action. The QC checker will review the deliverable again to verify that the corrective action was implemented and then close that comment. Review comments, responses, corrective actions, and back-checks will be tracked and documented to ensure that they are considered and/or implemented as well as to evidence the QA/QC process.

There may be review comments assigned to a deliverable that are not essential to that deliverable and would be better addressed in a different, future deliverable. In this case, the technical lead would decide that a corrective action should not be implemented and the QC checker would carry the comment forward to the appropriate future deliverable. The QC checker would then mark this comment as closed.

The QA/QC process is illustrated below.



4.3 THIRD-PARTY WORK PRODUCTS

Throughout different stages of the project, the project team will use outside data developed by other consultants or agencies. This may include topographic surveys, biological surveys, geophysical surveys, hydraulic analyses, and previous subsurface explorations. If possible, these outside data should include certification by a licensed professional that the data has gone through appropriate QA/QC by the entity providing the information.

5.0 QUALITY ASSURANCE DOCUMENTATION

The QA/QC team will provide documentation of the QA/QC process with the following deliverables:

- Quality Assurance Plan
- QC review tracking sheets
  - Initial QA prior to external review
  - Final QA following external review

ATTACHMENT 5: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 6: FIGURES

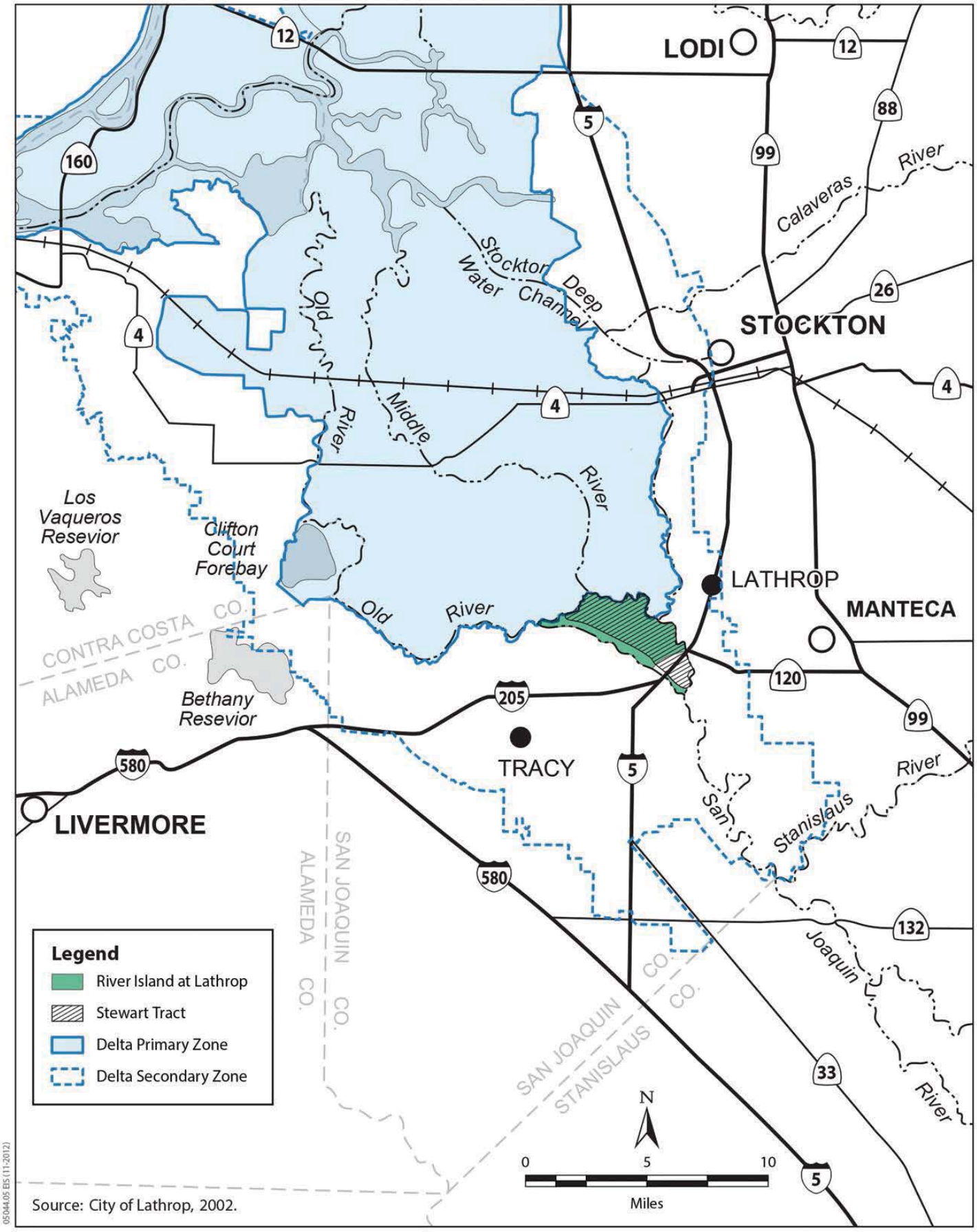

LODI
STOCKTON
LATHROP
MANTECA
TRACY
LIVERMORE
Los Vaqueros Resevior
Clifton Court Forebay
Bethany Resevior
Old River
Middle River
Old River
Stockton Deep Water Channel
Calaveras River
San Joaquin River
Stanislaus River
Joaquin River
CONTRA COSTA CO.
ALAMEDA CO.
SAN JOAQUIN CO.
STANISLAUS CO.
12
160
5
99
88
26
4
205
120
580
132
33
Legend
River Island at Lathrop
Stewart Tract
Delta Primary Zone
Delta Secondary Zone
N
0
5
10
Miles
Source: City of Lathrop, 2002.
05044.05 EIS (11-2012)

FIGURE 1

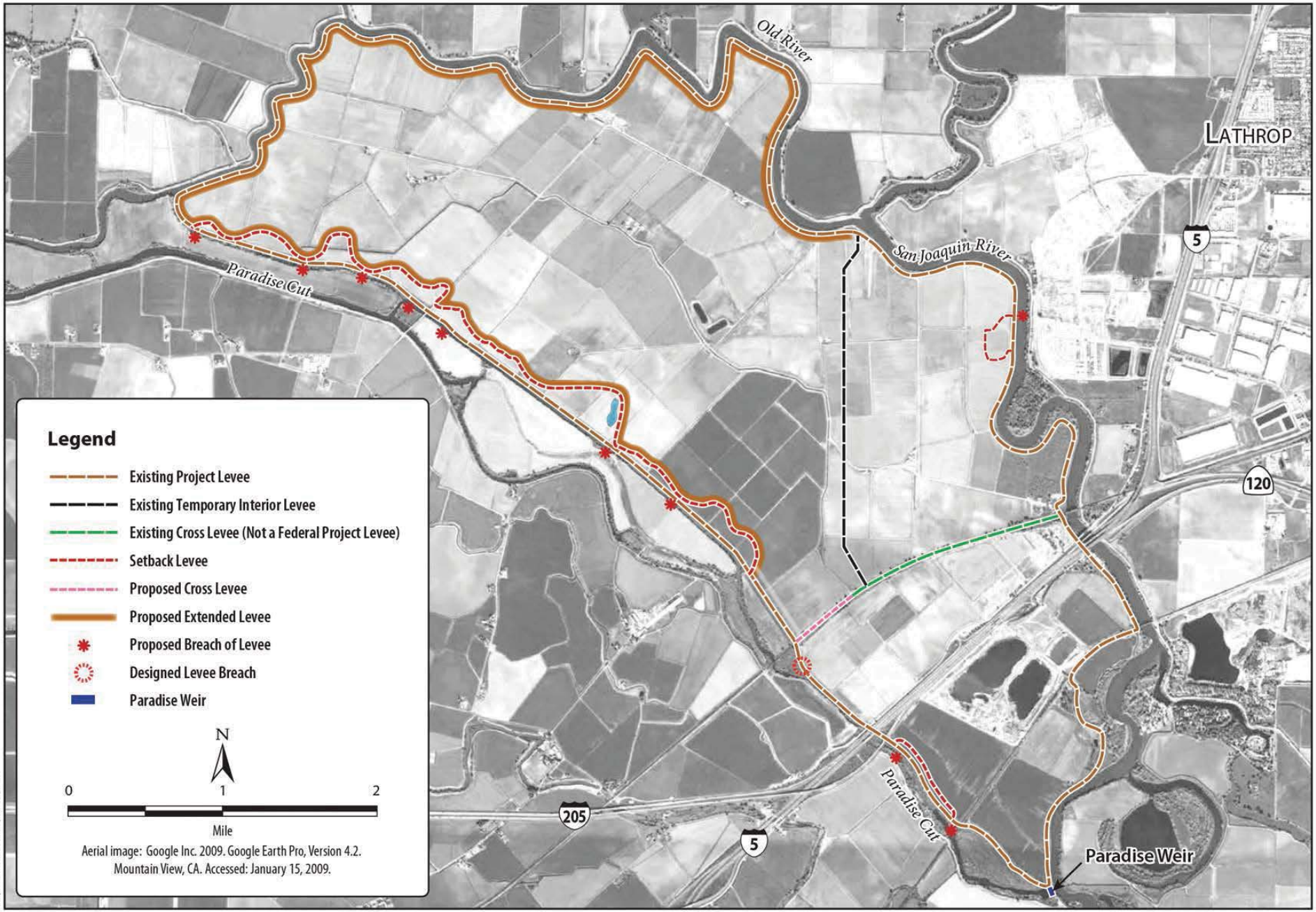

Old River
LATHROP
San Joaquin River
5
Paradise Cut
120
205
5
Paradise Cut
Paradise Weir
Legend
Existing Project Levee
Existing Temporary Interior Levee
Existing Cross Levee (Not a Federal Project Levee)
Setback Levee
Proposed Cross Levee
Proposed Extended Levee
Proposed Breach of Levee
Designed Levee Breach
Paradise Weir
N
0
1
2
Mile
Aerial image: Google Inc. 2009. Google Earth Pro, Version 4.2.
Mountain View, CA. Accessed: January 15, 2009.
Graphics... 05044 05 (3/4/13) AB

FIGURE 2

DISTRICT STATEMENT OF
SAFETY ASSURANCE REVIEW PANEL MEMBER
INDEPENDENCE AND QUALIFICATION FOR

RAY COSTA

FOR THE RIVER ISLANDS AT LATHROP PHASE 2B LEVEE PROJECT

Sacramento District Engineering Division has reviewed the National Academy of Sciences, Category 3 disclosure form for the above individual. The above reviewer meets the criteria for independence and qualifications per EC 1165-2-214 and the National Academy of Sciences' *Policy on Committee Composition and Balance and Conflicts of Interest* (2003).

Rick L. Poeppelman P.E.
Chief, Engineering Division

12 June 2017
Date

DISTRICT STATEMENT OF
SAFETY ASSURANCE REVIEW PANEL MEMBER
INDEPENDENCE AND QUALIFICATION FOR

DAVID T. WILLIAMS

FOR THE RIVER ISLANDS AT LATHROP PHASE 2B LEVEE PROJECT

Sacramento District Engineering Division has reviewed the National Academy of Sciences, Category 3 disclosure form for the above individual. The above reviewer meets the criteria for independence and qualifications per EC 1165-2-214 and the National Academy of Sciences' *Policy on Committee Composition and Balance and Conflicts of Interest* (2003).

Rick L. Poeppelman P.E.
Chief, Engineering Division

12 June 2017
Date

DISTRICT STATEMENT OF
SAFETY ASSURANCE REVIEW PANEL MEMBER
INDEPENDENCE AND QUALIFICATION FOR

LESLIE F. HARDER

FOR THE RIVER ISLANDS AT LATHROP PHASE 2B LEVEE PROJECT

Sacramento District Engineering Division has reviewed the National Academy of Sciences, Category 3 disclosure form for the above individual. The above reviewer meets the criteria for independence and qualifications per EC 1165-2-214 and the National Academy of Sciences' *Policy on Committee Composition and Balance and Conflicts of Interest* (2003).

Rick L. Boeppelman P.E. — 12 June 2017

Chief, Engineering Division — Date