



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
441 G STREET, NW
WASHINGTON, DC 20314-1000

REPLY TO
ATTENTION OF

CECW-SPD

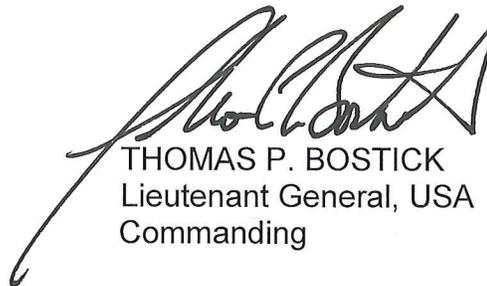
DEC 18 2015

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

SUBJECT: South San Francisco Bay Shoreline Interim Feasibility Study – Final U.S. Army Corps of Engineers (USACE) Response to Independent External Peer Review

1. Independent External Peer Review (IEPR) was conducted for the subject project in accordance with Section 2034 of the Water Resources Development Act of 2007, EC 1165-2-214, and the office of Management and Budget's Final Information Quality Bulletin for Peer Review (2004).
2. The IEPR was conducted by Battelle Memorial Institute. The IEPR panel consisted of five panel members with technical expertise in economics and plan formulation; environmental, civil and cost engineering; H&H and coastal engineering; and geotechnical engineering.
3. The final written responses to the IEPR are hereby approved. The enclosed document contains the final written responses of the Chief of Engineers to the issues raised and the recommendations contained in the IEPR report. The IEPR Report and the USACE responses have been coordinated with the vertical team and will be posted on the internet, as required in EC 1165-2-214.
4. If you have any questions on this matter, please contact me or have a member of your staff contact Mr. Bradd Schwichtenberg, Deputy Chief, South Pacific Division Regional Integration Team, at (202) 761-1367.

Encl



THOMAS P. BOSTICK
Lieutenant General, USA
Commanding

**South San Francisco Bay Shoreline
Interim Feasibility Study, Alviso Ponds and Santa Clara County, California
Integrated Feasibility Report and Environmental Impact Statement**

**U.S. Army Corps of Engineers Responses to
Independent External Peer Review
December 2015**

Independent External Peer Review (IEPR) was conducted for the subject project in accordance with Section 2034 of WRDA 2007, Engineering Circular (EC) 1165-2-214, Civil Works Review, 15 December 2012, and the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* (2004). The goal of the U.S. Army Corps of Engineers (USACE) Civil Works program is to provide the most scientifically sound, sustainable water resource solutions for the nation. The USACE review processes are essential to ensuring project safety and quality of products USACE provides to the American people.

Battelle Memorial Institute (Battelle), a non-profit science and technology organization with experience in establishing and administering peer review panels for USACE, was engaged to conduct the IEPR. The Battelle IEPR panel reviewed the Draft Integrated Feasibility Report and Environmental Impact Statement/Report, as well as the supporting documentation. Battelle provided the Final IEPR Report on 23 March 2015.

Overall, nineteen comments were identified and documented in the IEPR Report. Of the nineteen comments, the IEPR panel identified six as having medium/high significance, five as having medium significance, five as having medium/low significance, and three as having low significance.

- 'High': Describes a fundamental problem with the project that could affect the recommendation, success, or justification of the project.
- 'Medium': Affects the completeness of the report in describing the project, but will not affect the recommendation or justification of the project.
- 'Low': Affects the understanding or accuracy of the project as described in the report, but will not affect the recommendation or justification of the project.

The following discussions present the U.S. Army Corps of Engineers (USACE) Final Response to the Comments.

1. Final Panel Comment 1 – *Medium/High Significance*: The results of the CHAP modeling of ecological uplift for ecosystem restoration alternatives appear to be inconsistent with the current understanding and value of functioning tidal wetland habitats.

This comment includes two recommendations for resolution, one of which has been adopted, and one of which has not been adopted, as discussed below. The comment expresses the concern that CHAP modeling has resulted in ecosystem restoration screening results that do not accurately reflect likely beneficial ecological outcomes that would result from accelerated pond restoration and ecotone construction, and presents uncertainty regarding key elements of the NER plan. As

such, sole use of this modeling output to develop the ecosystem restoration component of the NED/NER plan may not be adequate given the study objectives.

USACE Response: Adopted

Action Taken: The IEPR panel recommended (1) adding to the Integrated Report a discussion of why the CHAP model was selected and why other ecosystem restoration models were not used. In response, the final CHAP report (Introduction) in Appendix B2 and the Final Integrated Report, Section 3.6.11 have been revised to incorporate additional information on why the CHAP model was selected, why it was not modified, and the limitations of the model. Multiple methods to quantify ecosystem restoration outputs were compared, and all had shortcomings. The CHAP was selected after coordination with several USACE offices and the USACE Vertical Team.

USACE Response: Not Adopted

The IEPR Panel also recommended (2) rerunning the CHAP model to confirm that the model can make accurate evaluations of ecosystem restoration alternatives. The CHAP model was selected based on reasons discussed in the Final CHAP report (Introduction) and the Final CHAP Summary (Appendix B2) and Section 3.6.11. The ecosystem benefits of tidal marsh restoration are currently being realized throughout the South Bay Salt Pond Restoration Project, and therefore it is not necessary to rerun the model to re-estimate benefits.

2. Final Panel Comment 2 – *Medium/High Significance*: Several assumptions (e.g., channel complexity and marsh development) used in the CHAP modeling of potential ecosystem restoration benefits are made without data or information to support use of the model.

This comment includes two recommendations for resolution, one of which has been adopted, and one of which has not been adopted, as discussed below. The comment expresses concern that without supporting data or information to substantiate assumptions in the CHAP model, it is difficult to be certain of the suitability of the modeling data and scheduling and ultimate cost of restoration efforts.

USACE Response: Adopted

Action Taken: The IEPR panel recommended (1) to provide information on the assumptions used in the CHAP modeling effort. In response, the CHAP report (Appendix B2, Final CHAP Report, Section: Methods for Determining Baseline Conditions) has been revised to include additional discussion of the assumptions.

USACE Response: Not Adopted

The IEPR panel also recommended (2) to rerun the CHAP model using assumptions that provide clear and accurate evaluations of ecosystem restoration alternatives. USACE accepts the results from the CHAP model because they are consistent with the outcome of actual restoration projects elsewhere in the San Francisco estuary that are similar in concept to what is proposed in this project. Therefore the CHAP model was not re-run.

3. Final Panel Comment 3 – *Medium/High Significance*: CHAP model projections have not considered potential indirect disturbances to wildlife from recreational users and wildlife predators or the suitability of island habitats in the restored salt ponds.

This comment includes two recommendations for resolution, neither of which was adopted, as discussed below. The comment expresses the concern that the CHAP modeling has resulted in ecosystem restoration screening results that may overestimate or underestimate ecosystem benefits.

USACE Response: Not Adopted

The IEPR panel recommended that USACE (1) evaluate in the CHAP model the impact of recreational use of the flood risk management levees and the use of the levees by wildlife predators on sensitive wildlife species and (2) model the suitability of island habitats in the restored salt ponds to meet project ecosystem restoration objectives.

This project reduces recreational access and predator access in and near tidal marshes in the study area relative to current conditions, by causing a net decrease in trail length. This will have a positive effect on wildlife. The CHAP model focuses on the entire community and provides biodiversity-weighted outputs. The model is not suited for analysis of one or a few species considered to be of high priority. The model was not used for island habitat, because geotechnical considerations made this measure inefficient. Portions of the remaining salt pond berms will remain and can function as islands during high tides and as sea levels rise.

4. Final Panel Comment 4 (Hydrology and Hydraulics) – *Medium/High Significance*: Residual risks associated with interior drainage and fluvial flooding are not adequately considered (per ER 1105-2-101), potentially affecting the project completeness and effectiveness.

This comment includes five recommendations for resolution, four of which have been adopted, and one of which was not adopted, as discussed below. The comment expresses concern that inclusion of the residual fluvial and interior drainage flooding would improve the overall completeness and effectiveness of the project, and possibly lead to an increase in the project cost.

USACE Response: Adopted

Action Taken: The IEPR panel recommended (1) a more thorough discussion of residual risk from fluvial and interior drainage in the main report and the Coastal Engineering and Riverine Hydraulics Appendix, (2) change all references of “residual risk” to “residual coastal flood risk” where residual risk is related only to the coastal flood risk, (3) inclusion of a map showing the potential flooding from interior drainage for storm events that range from the 10% to the 0.2% annual chance of exceedance and (4) discussion of interior drainage behind the proposed flood risk management levee and how it will be accomplished. In response, a map showing the Flood Risk Management Levee connection to existing flood risk management levees is located in the main report in Chapter 3.10, Figure 3.10-1. In response to Recommendations 1, 2, 3, and 4, a qualitative discussion of the residual flood risk from all sources of flooding was added (coastal, riverine, and

stormwater drainage) in Sections 4.4.2.3.2 (Impact HYD-2, page 4-116), 9.7.2; and Appendix D1 Coastal Engineering and Riverine Hydraulics Summary; and Annex 1 Riverine Hydraulics. Plate 55 in Annex 1, Appendix D1 shows the residual risk from the Guadalupe River. Where residual risk is discussed, the distinction is made whether the risk is coastal or tidal residual risk in the main report (Section 3.5.5.6, beginning on page 3-35 Comparison of Overtopping Probabilities and Residual Risk) and in Section 2.8.2 and 4.8.2 in Appendix D – Hydrology and Hydraulics.

USACE Response: Not Adopted

The IEPR panel also recommended that USACE (5) incorporate project components to eliminate any adverse impacts of potential fluvial and interior drainage flooding associated with the project. The conclusion of the USACE analysis found the project does not adversely impact the existing stormwater drainage system and therefore additional project components are not needed. The proposed levee does not affect current interior drainage, as it replaces the current system of salt pond infrastructure currently preventing coastal flooding.

5. Final Panel Comment 5 – *Medium/High Significance*: The ring levee has not been analyzed as a separable element of the non-structural flood risk management option, and the levee segment to protect the San José-Santa Clara Regional Wastewater Facility has not been analyzed as an incremental feature of the Tentative NED/NER plan and the LPP in accordance with ER 1105-2-100.

This comment includes one recommendation for resolution, which was not adopted, as discussed below. This comment expresses concern that formulation and evaluation of all options and incremental justification of separable elements are needed to determine the NED features of the Tentative NED/NER plan and the LPP.

USACE Response: Not Adopted

The IEPR panel recommended that (1) the final Integrated Report contain an analysis of the levee to protect the Regional Wastewater Facility as a first added and last added increment of the NED/NER plan and the LPP. The ring levee is discussed in the main report as a non-structural measure; however, it was screened out during formulation and was not evaluated as a standalone measure because it would be an incomplete plan that would not meet project objectives. A plan that only included the ring levee would leave the community of Alviso subject to catastrophic and repetitive flood damages, resulting in public health and safety risks. The low benefit/cost ratio for the non-structural plan was primarily due to the high cost of relocations. Given the levee alternatives were much more efficient than the non-structural plan (and because the ring levee by itself would be an incomplete plan), the Final Report (Section 3.5.5.1) documented the Value Engineering Study that recommended dropping the non-structural plan from further consideration. The ring levee is discussed in the executive summary, page S-14, Sections 2.4.3, and in Section 3 on pages 3-11, 2-52, and 3-20.

The NED/NER and LPP levee alignment is continuous and protects the Community of Alviso and the WPCP. The plan therefore does not include a separable segment to protect the WPCP. Alternative levee alignments were formulated to provide the most efficient and effective risk reduction to the Alviso community and did not include a ring levee to protect the WPCP as a

separable element. With the combined plan that includes the outboard levees breached to allow for pond restoration, any levee alignment developed must assure that the project can effectively reduce risks to the community without inducing damages. The levee end-points must tie in to high ground or otherwise extend to a location as necessary to assure that large portions of the floodplain are not subject to significant residual risk. The NED/NER and LPP levee alignment is the least cost alignment that meets the objective of reducing flood risks without either leaving large areas of the floodplain with significant residual risk or inducing damages in the study area.

6. Final Panel Comment 6 – *Medium/High Significance*: The project cost estimate does not consider several project details that could impact the project costs and selection of the NED and NER plans, and the LPP.

This comment includes nine recommendations for resolution, five of which were adopted and four of which were not adopted, as discussed below. The comment expresses concern that the cost estimates of the alternatives do not match key design and construction details of the project, and this could affect selection of the NED/NER plan and could increase risk to the schedule and cost of the project.

USACE Response: Adopted

Action Taken: The IEPR panel recommended that USACE (4) evaluate risk associated with the need for dewatering, especially in Reaches 2 and 3 adjacent to Pond A16; (5) correct the Civil Design Appendix regarding the quantity of wick drain linear feet and compare to the quantity used in the estimate; (6) evaluate assumptions regarding the availability of borrow from other non-Federal sponsor-owned project sites and adjust the cost estimate if necessary; (7) evaluate the number and placement of ditch blocks or additional channels to achieve the objective to not strand fish; and (9) evaluate the impact of air quality mitigation on cost estimate production rates and adjust either the cost estimate or the contingency.

In response, Section 4 of the main report (pages 4-116, 4-117) and Geotechnical Appendix G, Section 3.1 has been updated to incorporate a qualitative description of construction site dewatering, and the cost contingency was reevaluated. The text of the Civil Design Appendix E1 has been updated throughout the appendix to match the wick drain quantities used in the cost estimate. Borrow material has been reassessed and determined to be available at zero cost to the project. The cost estimate has been adjusted throughout the project costs to account for slower production rates based on the impacts of air quality mitigation. The 15 mph speed limit was not much slower than the originally assumed speed and had a minor effect on the overall cost (+ \$1-2M). Ditch blocks are quantified for all ponds in Appendix E, on the page Quantities 06 – Quantities for Pond Restoration Ditch Blocks.

USACE Response: Not Adopted

The IEPR panel recommended that USACE (1) determine the most appropriate cost account for the tide side bench and modify the cost estimate accordingly, and reevaluate the NER and restoration increment of the LPP, (2) adjust the cost estimate for the restoration bench and the restoration ecotone for consistency.

In response to both recommendations 1 and 2, the 50-foot wide bench is associated with levee construction because the excavated material would otherwise be hauled off-site and disposed (saving hauling fees and bringing in new material for the bench). The bench also serves as a buffer against normal tides and results in incidental transitional habitat. The main report (Executive Summary p ES-19, Section 3.6.9 Transitional Habitat, and in the Civil Design Appendix (Section 2.2) have been modified to better describe the multi-purpose functions consistently (i.e., engineering and environmental) that are leveraged by the 50-foot wide bench, and the construction logistics that support the inclusion of the bench in the flood risk management levee account.

The IEPR panel also recommended that USACE (3) add a cost for final grading of the overbuild levee sections and (8) evaluate risk associated with hazardous waste discharge at wick drains and update the cost contingency.

The levee will be overbuilt in a single phase to accommodate elevation loss via consolidation settlement. The levee crest and side slopes will not be re-graded after settlement occurs; if the project were to re-grade the levee, the hydro seeding work would have to be delayed leaving the levee exposed to the weather and erosion, or would need to be hydroseeded twice. The Civil Design Appendix was modified in Section 3.1.2 to include a discussion of how the geologic profile and side-slopes (pre- and post-consolidation) have led to conclude that substantial re-grading of the levee to remove hump-backing, wash-boarding, etc. would not be necessary. A review of hazardous waste sites confirmed that there are no known sites along the levee alignments and there is a very low likelihood of release of hazardous waste by wick drains in the levee. Table 4.8-1 in the Main Report was revised and is no longer ambiguous to the existence of hazardous waste along the levee alignment.

7. Final Panel Comment 7 – *Medium Significance*: Borehole data may not have been taken from sufficient depths to provide a dataset to verify the liquefaction-settlement calculations.

This comment includes two recommendations for resolution, one of which has been adopted and one of which has not been adopted, as discussed below. The comment noted that if loose or soft conditions exist beneath the penetration depths of CPT and boreholes presented, it is possible that additional settlement may occur that is not included in the liquefaction calculation estimates for the alternatives analysis.

USACE Response: Adopted

Action Taken: The IEPR panel recommended (1) including a discussion of soil consistency and soil type at deeper depths based on available data and analyses in Appendix G (Geotechnical). In response, Appendix G has been expanded to better describe the geologic setting and the typical subsurface stratigraphy of the South San Francisco Bay (Sections 2 and 3). Descriptions for potential impacts from seismic hazards have been improved in Appendix G, Section 3.1.3.

USACE Response: Not Adopted

The IEPR panel recommended that the USACE (2) consider additional field geotechnical exploration to depths greater than the 9.5 to 45 feet presented in the boreholes and CPTs to confirm soil density and soil consistency and whether liquefaction-induced settlement or other issues with seismic events may be an issue. Since the depth of the existing data set is sufficient to characterize

the liquefaction hazard for feasibility phase decisions, no additional field explorations are necessary at this time. The subsurface stratigraphy in the project area can be summarized as bay muds over marine deposits. The likelihood of encountering liquefiable layers below the marine deposits is generally low. The only known cases of liquefaction at depths greater than 45 feet were related to subduction zone type earthquake events substantially more powerful than the slip-strike events of the San Francisco Bay. Even if there were settlement due to localized liquefaction, it would be unlikely to effect the global integrity of the levee and would likely be repairable prior to the next flood event.

8. Final Panel Comment 8 – *Medium Significance*: Borehole and cone penetrometer test data are provided to depths up to 45 feet, which is not sufficient to assess the concept-level design of foundations for tidal gate structures and bridges and to determine associated costs.

This comment includes two recommendations for resolution; one was adopted and one was not adopted, as discussed below. The comment expresses concern that it is important to provide boreholes and CPT data extending to suitable depths so that foundation requirements and costs are analyzed in sufficient detail for the concept-level alternatives, particularly since deep pile foundations will likely be required to extend beyond the 30 to 45 feet of the depths investigated.

USACE Response: Adopted

Action Taken: The IEPR panel also recommended (1) a review of available historic cone penetrometer and borehole data in the vicinity of the inboard levee system for the TSP, and determine whether enough information is available to accurately present concept alternatives and costs for this phase. In response, the data were reviewed and they provide sufficient information to support concept level design recommendations for the dimensions and depths for the foundation and concrete piles. Section 3.2 of the Geotechnical Appendix was updated to highlight the geologic profile from borings 47a, 48a, and 52a (i.e. < 50 ft from the tide gate) as the basis for the foundation depth and to explicitly commit to additional borings/analysis in the Preconstruction Engineering and Design phase to support and develop the final basis of design.

USACE Response: Not Adopted

The IEPR panel also recommended (2) consideration of performing additional boreholes and/or CPT data to deeper depths to inform the evaluation of alternatives for the bridge structure and tidal gate structures, if sufficient geotechnical information is not available; or revise the narrative in the draft Integrated Document if the additional geotechnical information is in fact available

Since the available geotechnical data are sufficient (recommendation 1 above) for evaluation of alternatives, additional field explorations were not performed. Section 3.2 of Appendix G (Geotechnical) notes that additional geotechnical data will be collected during the PED Phase to support final design.

9. Final Panel Comment 9 – Medium Significance: Inconsistencies in wick drain spacing, location, and installation procedures are presented in the draft Integrated Document.

This comment includes four recommendations for resolution, all of which were adopted, as discussed below. The comment expressed concern that the potential formation of mud waves or instability of the levee during construction may lead to failure of wick drains, which would affect the construction of the levee system over Bay mud, and may require the installation of additional wick drains.

USACE Response: Adopted

Action Taken: The IEPR panel recommended (1) revision of Appendix E1 (Civil Design) and Appendix G (Geotechnical) to consistently depict the required wick drain horizontal spacing. In response, both appendices were revised and conformed. The IEPR panel recommended (2) inclusion of a discussion of the likelihood that variable or revised spacing of wick drains will be considered during preconstruction engineering design. In response, Appendix G was revised in Section 3.1.1 and 3.1.2 to address spacing of wick drains. The IEPR panel recommended (3) a discussion of the potential for levee instability or mud wave formation during construction and how this may impact the success of wick drain installations. In response, Appendix G was revised in Section 3.1.2 to discuss the potential for levee instability or mud wave formation. The IEPR panel recommended (4) a discussion of the monitoring and construction procedures that will minimize potential for wick drain failures and costly reconstruction should mud waves or instability occur. In response, Appendix G was revised in Section 3.1.2 to include the monitoring and construction procedures to minimize wick drain failures and mud wave formation.

10. Final Panel Comment 10 -- Medium Significance: The LERRD project requirements appear to be underestimated since the real estate analysis does not consider key design and construction details, including an overbuilt levee cross-section and the need for more staging and stockpiling area.

This comment includes five recommendations for resolution, all of which were adopted. The comment expressed concern that the Real Estate Plan as described does not align with key design and construction details of the project, which, if not appropriately addressed, could underestimate project cost and schedule risk.

USACE Response: Adopted

Action Taken: The IEPR panel recommended (1) verification of pre-construction cross section requirements for construction temporary work area. In response, the temporary work area easement was confirmed in Appendix E1 (Civil Design) and Appendix G (Geotechnical), no changes were made as a result of this comment. The IEPR panel recommended (2) an estimation of the staging stockpiling, and processing area required during construction and whether the required area would fit into the footprint of the ecosystem restoration waterside bench. In response, reassessment of the staging, stockpiling and processing area verified that all work would fit into the footprint of the ecosystem restoration bench, therefore no changes were made to the Civil or Geotechnical Appendices. The IEPR panel recommended (3) estimation of the available land on the dry side of the A18 levee to determine whether additional LERRD is required. In response, the estimate was reassessed, and the LERRD described in the Real Estate Appendix is

sufficient. The IEPR panel recommended that (4) the findings of these reassessments be forwarded to the Real Estate group. Since no changes were required, all estimates were confirmed as appropriate by the Real Estate office. The IEPR panel recommended (5) an update to the Real Estate Plan, including cost estimates, for the increased temporary work areas, flood levee easements, and staging areas. All lands and easements were confirmed adequate for implementation, therefore, the Real Estate Plan required no revisions.

11. Final Panel Comment 11 – *Medium Significance*: A cost-benefit analysis of capping mercury methylation hot spots in ponds planned for ecotone and levee construction as a mitigation measure is not provided, so it is not known whether this mitigation measure was considered.

This comment includes two recommendations for resolution, one of which was adopted and one was not. The comment expressed concern that a cost-benefit analysis of capping mercury hot spots in the ponds proposed for levee and ecotone construction could identify the full range of water quality and biological resource avoidance and minimization measures applicable to the project.

USACE Response: Adopted

The IEPR panel recommended that USACE (2) consider in project construction contingency planning and cost estimating the capping mercury of hot spots with off-site clean fill if the cost-benefit analysis determines capping would increase control of mercury methylation and dispersal, and avoid or minimize water quality and biological resource impacts in the project area beyond the proposed mitigation measures.

The potential for mercury capping will continue to be evaluated through PED, and if an issue arises, the appropriate action will be taken. However at this time there is no information indicating whether mercury hot spots are an issue; therefore the main report was not revised.

USACE Response: Not Adopted

The IEPR panel recommended (1) a cost-benefit analysis of using off-site clean fill to cap mercury hot spots in Ponds A12, A13, and A18,

The final Integrated Report was revised to explain why capping mercury hot spots is not a feasible or useful approach to mercury contamination in the area (Executive Summary S.3.12.6, Section 3.6.7, and 3.11.5). Methylmercury is also discussed in relation to effects on resources throughout Section 4.

12. Final Panel Comment 12 – *Medium/Low Significance*: The Cost Effectiveness/Incremental Cost Analysis was conducted by grouping ponds based on construction phase; however, it appears that analyzing each pond as an independent management measure was not considered.

This comment includes one recommendation for resolution, which was not adopted. The comment expressed concern that identification and evaluation of all possible combinations of management measures and scales is needed to determine the NER component of the NED/NER plan and the LPP.

USACE Response: Not Adopted

The IEPR panel recommended (1) preparing a Cost Effectiveness/Incremental Cost Analysis that analyzes restoration of each pond as an individual measure and incorporate the results into the final Integrated Document, Section 3.6.

The cost effectiveness and incremental cost analysis was performed using a limited groups of ponds because these are the combinations of individual ponds that could be implemented (Section 3.6.12.3 (CE/ICA). The pond groupings are evaluated in the plan formulation section 3.6.12.4 and discussed Appendix B1 (Shoreline Study Preliminary Alternatives and Landscape Evolution Memo). Ponds that are restored must have a direct connection to tidal circulation or a connection through an already restored pond, therefore, individual ponds would not be restored independently. Only one pond, A18, can be restored independently of the other seven ponds.

13. Final Panel Comment 13 – *Medium/Low Significance*: The discussion of the sediment budget does not specify the level of influence the Tentative NED/NER plan or the LPP may have on the overall sediment budget of the system.

This comment includes three recommendations for resolution, all of which were adopted. The comment expressed concern that a discussion of the potential influence of the NED/NER plan or the LPP on the sediment budget of the system would improve the completeness of the draft Integrated Document.

USACE Response: Adopted

Action Taken: The IEPR panel recommended that (1) the Coastal Engineering and Riverine Hydraulics Appendix be revised to include more information about the sediment budget analysis for the historical and baseline conditions, and that (2) the Coastal Engineering and Riverine Hydraulics Appendix include additional information regarding the sediment budget analysis for the future without-project condition. In response, more information on the sediment analysis for all three conditions is included in the Appendix D1, Section 2.4.3 and 2.5.2. The IEPR panel also recommended that USACE (3) incorporate the analysis and results of a sediment budget analysis into the future with-project condition. A discussion of the with-project impact on the sediment budget is included in Section 4.5 of Appendix D1. The discussion is qualitative since impacts depend on the timing and degree of pond breaching that will be assessed through the adaptive management process.

14. Final Panel Comment 14 – *Medium/Low Significance*: There appears to be a potential scheduling conflict between the proposed in-water work construction period and plans to minimize project impacts on steelhead and nesting birds.

This comment includes three recommendations for resolution; one was adopted and two were not adopted. The comment expressed concern that a clear assessment of the potential geographical range of juvenile steelhead and nesting birds during construction would strengthen the understanding of potential combined seasonal construction restrictions, as well as the feasibility of the proposed construction schedule and cost estimate if these species' ranges overlap.

USACE Response: Adopted

Action Taken: The IEPR panel also recommended (2) an evaluation of whether there will be combined construction timing or location restrictions for juvenile steelhead and nesting birds. In response, Figure 4.7-2 in the main report was revised to show the windows in which construction restrictions would be applied per the Biological Opinions. USACE will work closely with USFWS and NMFS during the construction phases. The steelhead constriction limitation would affect only two activities, pond breaching and construction of the tide gate on Artesian Slough. Pond breaching can easily be limited to a short period during the year as it takes very little time. No impact on the cost of pond breaching is expected.

USACE Response: Not Adopted

The IEPR panel recommended (1) a more detailed description of the potential geographical range of juvenile steelhead and nesting birds during each major construction element affecting their habitats.

Juvenile and adult steelhead trout can occur anywhere in the area, though adults are more likely to be restricted to larger channels with freshwater inputs. Locations of nesting birds can occur on any suitable habitat, and vary greatly from year to year. Greater specificity on this item is not possible, however, further coordination during the construction phase would occur, along with preconstruction surveys.

The IEPR panel also recommended (3) integration of combined construction timing restrictions into the construction schedule and cost estimate if cumulative construction timing restrictions are expected to occur.

Cumulative construction timing restrictions are not expected since juvenile steelhead limitations would affect only a few activities and locations.

15. Final Panel Comment 15 – Medium/Low Significance: A comprehensive plan for communicating residual risk and expected flood damages to the floodplain residents is not provided.

This comment includes one recommendation for resolution, which was adopted. The comment expressed concern that communicating residual risk in the draft Integrated Document will more fully disclose the risks associated with the project.

USACE Response: Adopted

Action Taken: The IEPR panel recommended that the final Integrated Document include a comprehensive plan for communicating residual risk and expected flood damages to the floodplain residents.

In response, the study communicated the existing flood risk, expected flood risk reduction from the project, and the remaining residual flood risk after the project is built, at public meetings to date and will continue to communicate these flood risks at any future public meetings. A floodplain management plan will be developed by the project sponsor within 1 year after the date of signing a project cooperation agreement as documented in Section 10.2 of the main report.

16. Final Panel Comment 16 – *Medium/Low Significance*: The description of levee access does not provide sufficient information to determine whether required operations and maintenance activities can be conducted.

This comment includes two recommendations for resolution, both of which were adopted. The comment notes that a concise description of levee access for maintenance and operations would improve the completeness of the draft Integrated Document.

USACE Response: Adopted

Action Taken: The IEPR panel recommended (1) the plan include required and reasonable levee ramps, turnouts, and access roads needed for normal maintenance operations and floodfighting. In response, the descriptions of access to the levee crest were improved in Appendix G (Geotechnical), Section 2.1.1. Additional turn-arounds were added for the railroad crossing and halfway between Artesian Slough and the eastern terminus of the levee and are noted in Section 3.1.2 Appendix E1 (Civil Design). The IEPR panel also recommended (2) the cost estimates and LERRD be updated to include the additional access points. No additional access points were required for maintenance operations and floodfighting and additional turnarounds are within the identified real estate. In response, the construction cost estimates were updated to include earthwork for the turnarounds (Appendix E1 – Quantities Tables).

17. Final Panel Comment 17 – *Low Significance*: It is unclear whether the models and assumptions for assessing life safety hazards has been addressed or if a life safety analysis has been completed.

This comment includes one recommendation for resolution, which was adopted. The comment notes that for completeness, the decision document would benefit from a discussion of life safety risks associated with flooding and how they may impact the feasibility of the TSP (i.e. LPP).

USACE Response: Adopted

Action Taken: The IEPR panel recommended that the Integrated Document acknowledge potential life safety risks associated with the future without-project and with-project conditions. In response, an expanded evaluation and discussion of health and life safety risks for without and with project conditions was added to the Economic Appendix (Section 7.2 of Appendix C).

18. Final Panel Comment 18 – *Low Significance*: Risks associated with the potential malfunction of the railroad closure structure during an extreme high water event or fluvial flood event are not addressed.

This comment includes two recommendations for resolution, one that was adopted and one that was not adopted. The comment notes that inclusion of the risks associated with the potential malfunction of the railroad closure structure would provide a complete discussion of project risks.

USACE Response: Adopted

Action Taken: The IEPR panel recommended (1) a discussion of the risk associated with the potential malfunction of the railroad closure structure in the final version of the draft Integrated Document. In response, the Appendix E1 (Civil Design), Section 3.2 was revised to say, The

selected closure would be operated manually and coordinated with local authorities and the railroad in anticipation of a flood. Manual operation minimizes the risk of mis-operation on an active railroad at the risk of not being closed during a tidal flood event. Not closing the gate would result in limited flooding but would not induce additional failure modes along other FRM features.

USACE Response: Not Adopted

The IEPR panel recommended (2) including two maps as part of the discussion of risk with the railroad closure structure: inundation extents for the gate remaining open during an extreme high water tidal event; and inundation extents for the gate remaining closed during an extreme fluvial flood (0.2% annual chance event) on the Guadalupe River. The Appendix E1 (Civil Design) was revised to acknowledge that there is a risk of not closing the structure at the railroad crossing during a fluvial flood event. However, the extent of flooding during these different types of events was not analyzed. The FRM features on the right bank of the Guadalupe River can contain a 1% ACE discharge (100-year event). A 0.2% ACE (500-year event) would overtop the Guadalupe River FRM features but would not raise the water surface elevations of the San Francisco Bay enough to overwhelm the proposed Shoreline project FRM features (a 0.2% ACE tidal event is not equal to a 0.2% ACE fluvial event).

Final Panel Comment 19 – *Low Significance*: It is not clear whether the purpose of the recreation features evaluated is to mitigate the loss of existing recreation or to add features to those that currently exist.

This comment includes one recommendation for resolution, which was adopted.

USACE Response: Adopted

Action Taken: The IEPR panel recommended inclusion of a table in the final Integrated Document that lists recreation features and associated costs, categorized by measures proposed to compensate for lost recreation opportunities and measures proposed to provide additional recreation benefits. The recreation analysis was revised in the main report in Section 3.7.1 to first assess the impacts to existing recreation resulting from the proposed project features without the use of a table. The benefits of proposed recreation features, which are a secondary project purpose, were also assessed, and a benefit/cost analysis was conducted to verify that these features are economically justified. Justification for recreation features is based on their benefits relative to their costs, not as mitigation.