

# Final Independent External Peer Review Report South Central Coast, Louisiana, Feasibility Study

Prepared by  
Battelle Memorial Institute

Prepared for  
Department of the Army  
U.S. Army Corps of Engineers  
Coastal Storm Risk Management Planning Center of Expertise  
Baltimore District

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Columbus, Ohio 43201

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## Executive Summary

### Project Background and Purpose

Hurricanes, riverine flooding, rainfall, and tropical storms pose a significant risk to the communities, ecosystems, and industries of the Louisiana gulf coast. Approximately 177,000 people reside within the study area for the South Central Coast Louisiana, Feasibility Study (FS). The area has suffered from disasters and will continue to suffer from natural disasters without some form of Coastal Storm Risk Management (CSRM) solution. Repeated storm events (including Hurricanes Andrew, Rita, Gustav, and Ike, which made landfall affecting the entire study area) resulted in economic damages to structures and properties, wildlife and property, and repeated mandatory evacuation costs. Emergency declarations have been declared in 22 of the last 30 years, due to coastal storm or riverine flooding damages. This area is also vulnerable to coastal land loss and degradation, reducing the natural resiliency of the area to storm surge and flood attenuation. From 1932 to 2010, the area experienced a net loss of approximately 22,500 acres of wetlands. The continuous wetlands losses impact migratory species, the ecological nurseries of the Gulf of Mexico, and various commercial and recreational activities.

The study area comprises ecosystems having national significance as demonstrated by the presence of Bayou Teche National Wildlife Refuge (NWR), the State of Louisiana Marsh Island Wildlife Refuge, the Attakapas and Atchafalaya Delta Wildlife Management Areas (WMAs), and the Federal authorizations and implementation of the U.S. Army Corps of Engineers (USACE) Mississippi River and Tributaries project, the USACE Atchafalaya Basin Floodway System, the multi-Federal agency Coastal Wetlands Planning, Protection and Restoration Act program, and by the USACE Louisiana Coastal Area program. The Atchafalaya Basin is unique because it has a growing delta system. Designated by Congress in 2006 as a National Heritage Area, the Atchafalaya Basin has significant cultural, historic, scenic, and recreational resources. It is the nation's largest alluvial bottomland and swamp, providing habitat for 24 Federal- and state-listed threatened or endangered species, or species of concern such as Louisiana black bear, brown pelicans, and bald eagles. About 22 million pounds of crawfish are commercially harvested annually from the basin.

The area also includes many industries with national significance, including the carbon black manufacturing plants of Cabot Corporation, Columbian Chemicals, and Degussa Engineered Carbons. These plants are among the largest carbon black producers in the United States. The area is a hub for ship building and fabricating, oil and gas services, and extraction industries vital to the U.S. economy. The Strategic Petroleum Reserve maintains storage facilities immediately north and west of the study area, with transfer and processing infrastructure traversing the area. Numerous Federal lands and water resources investment programs are active in the study area. In addition, Congress, in Section 906 (e) and (f) of the Water Resources Development Act of 1986, enacted legislation that designated fish and wildlife enhancement within the Lower Atchafalaya Basin Floodway as having national significance.

South Central Coast FS residents are currently at risk primarily from coastal storms. The project area consists of approximately 75,263 structures above the ground surface valued at \$18.6 billion. Residential and non-residential structures are raised on average 1 to 2 feet. Current Federal projects are largely constructed on the eastern edge of the study area. The existing Atchafalaya Basin Floodway System was authorized to address riverine flooding from the Atchafalaya River Basin and was not designed to address coastal storm surge occurring from tropical storm events.

The study area suffers from the highest relative sea level rise (RSLR) in the country. Sea level rise at moderate- and high-level projections would result in loss of Marsh Island, further loss of barrier islands like Rabbit and Duck Key, and loss of marsh habitat in the project area. Loss of remaining barrier islands and marsh habitat would allow storm surge and damages to occur farther up into the human settlements within St. Martin, St. Mary, and Iberia Parishes. Impacts of storm events could increase with increasing RSLR.

## Independent External Peer Review Process

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. USACE is conducting an Independent External Peer Review (IEPR) of the South Central Coast, Louisiana, Draft Feasibility Study (hereinafter: South Central Coast FS IEPR). As a 501(c)(3) non-profit science and technology organization, Battelle is independent, is free from conflicts of interest (COIs), and meets the requirements for an Outside Eligible Organization (OEO) per guidance described in USACE (2018). Battelle has experience in establishing and administering peer review panels for USACE and was engaged to coordinate this IEPR. The IEPR was external to the agency and conducted following USACE and Office of Management and Budget (OMB) guidance described in USACE (2018) and OMB (2004). This final report presents the Final Panel Comments of the IEPR Panel (the Panel). Details regarding the IEPR (including the process for selecting panel members, the panel members' biographical information and expertise, and the charge submitted to the Panel to guide its review) are presented in appendices.

Based on the technical content of the decision documents and the overall scope of the project, Battelle identified potential candidates for the Panel in the following key technical areas: plan formulation/economics, environmental law compliance/cultural resources, hydrology and hydraulic (H&H) engineering, civil engineering, and geotechnical engineering. Battelle screened the candidates to identify those most closely meeting the selection criteria and evaluated them for COIs and availability. USACE was given the list of all the final candidates to independently confirm that they had no COIs, and Battelle made the final selection of the five-person Panel from this list.

The Panel received electronic versions of the decision documents (908 pages in total), along with a charge that solicited comments on specific sections of the documents to be reviewed. Following guidance provided in USACE (2018) and OMB (2004), USACE prepared the charge questions, which were included in the draft and final Work Plans.

The USACE Project Delivery Team (PDT) briefed the Panel and Battelle during a kick-off meeting held via teleconference at the start of the review to provide the Panel an opportunity to ask questions of USACE and clarify uncertainties. Other than Battelle-facilitated teleconferences, there was no direct communication between the Panel and USACE during the peer review process.

IEPR panel members reviewed the decision documents individually and produced individual comments in response to the charge questions. The panel members then met via teleconference with Battelle to review

key technical comments and reach agreement on the Final Panel Comments to be provided to USACE. Each Final Panel Comment was documented using a four-part format consisting of (1) a comment statement; (2) the basis for the comment; (3) the significance of the comment (high, medium/high, medium, medium/low, or low); and (4) recommendations on how to resolve the comment. Overall, 13 Final Panel Comments were identified and documented. Of these, three were identified as having medium/high significance, two have medium significance, four have medium/low significance, and four have low significance.

Battelle received public comments from USACE on the South Central Coast FS/Environmental Impact Statement (EIS) (approximately 17 pages of comments) and provided them to the IEPR panel members. The panel members were charged with determining if any information or concerns presented in the public comments raised any additional discipline-specific technical concerns with regard to the South Central Coast FS/EIS. After completing its review, the Panel confirmed that no new issues or concerns were identified other than those already covered in the Final Panel Comments.

## Results of the Independent External Peer Review

The panel members agreed on their “assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used” (USACE, 2018) in the South Central Coast FS/EIS. Table ES-1 lists the Final Panel Comment statements by level of significance. The full text of the Final Panel Comments is presented in Section 4.2 of this report. The following summarizes the Panel’s findings.

Based on the Panel’s review, the report is well-written, concise, and provides supporting documentation on most engineering, environmental, economic, and plan formulation issues. In general, the Panel believes the project and review documents addressed a difficult problem with limited potential effective alternatives available to choose from. However, the Panel identified several technical elements of the project formulation where additional analysis is warranted and places where project findings and objectives need to be documented or clarified.

**Plan Formulation:** The Panel understands that the area under assessment has limited structural and non-structural alternatives available for consideration. However, based on the information provided, some concerns remain regarding the measures and alternatives considered in the plan formulation. The Panel’s first concern is that Measures 2 and 3 were prematurely screened out due to a lack of consideration of Objective 1c in the initial screening. Without considering evacuation benefits from the very beginning, it is unclear whether these measures that specifically addressed Objective 1c would have successfully moved forward if they had not already been screened out in the initial screening.

The Panel also noted that an alternative which combines elevating some structures with acquisition and relocation of other structures was not considered. The Panel believes that combining these two methods of addressing the flood risk and life safety elements may lead to a higher benefit-cost ratio (BCR) than each measure on its own.

Finally, for the South Central Coast FS/EIS to be complete, the Panel believes that additional documentation is needed regarding the assumption that 100% of homeowners or property owners would participate in voluntary structure-raising and floodproofing. During discussions, USACE stated that lower participation would result in lower costs but would not result in a different Tentatively Selected Plan (TSP). However, by clearly documenting whether USACE truly believes 100% participation is realistically

feasible, the South Central Coast FS/EIS would present a clearer understanding of the residual risks. The Panel also believes that the South Central Coast FS/EIS needs to clearly document the level of tolerable residual risk that would remain after implementation of the TSP. From the information provided, the Panel believes the residual risk is higher than the overall decrease in expected annual losses covered by the TSP.

**Engineering:** The Panel noted several aspects of the engineering documentation that need clarification. With regard to levee design, the Panel is unclear why a Factor of Safety (FoS) of 1.2 was chosen where breaching could lead to inundation. This is lower than the FoS that is normally suggested in these instances by USACE Engineer Manual (EM) 1110-2-1913. The Panel also does not understand why the advantages and benefits of staged construction were not maximized, considering that staged construction would result in lower quantities of levee embankment being needed and lower levee costs.

The Panel could not find information on the effectiveness of the 3-foot above-grade floodproofing criteria for non-residential buildings. From the information provided, these criteria may be ineffective at reducing flood risk for the required 1% annual exceedance probability (AEP) design event considering RSLR and storm surge over the 50-year project performance period. Including information on the effectiveness of these actions will help further explain the effectiveness of the TSP. The Panel also believes that more information on preliminary design and costs for floodproofing of nationally significant non-residential structures is needed. If included in the benefit-cost analyses, could result in a TSA that includes additional structures within the 50-year or 100-year storm surge floodplain.

**Economics:** The Panel believes that the report would be more complete and TSP selection would be substantiated if the National Economic Development (NED) benefits associated with reduction of life safety, nationally significant industries, and evacuation/reoccupation were quantified and included in the BCR. Quantification of NED benefits may substantially elevate the BCR of measures which were screened early in the plan formation process.

**Environmental:** From the National Environmental Policy Act (NEPA) and cultural resources perspective, the Panel noted that the South Central Coast FS/EIS and associated appendices are generally very well presented for this phase of the project. However, the documents would be strengthened by providing additional information on the potential for environmental impacts, including life safety hazards, and for flooding impacts on non-participants, minority or low-income groups, and heritage areas and ecosystems of national significance that are present in the study area. The Panel also found that several of the impacts described were not defined as direct, indirect, or cumulative impacts, as required by NEPA.

**Table ES-1. Overview of 13 Final Panel Comments Identified by the South Central Coast FS IEPR Panel**

No.	Final Panel Comment
<b>Significance – Medium/High</b>	
1	
2	
3	
<b>Significance – Medium</b>	
4	
5	
<b>Significance – Medium/Low</b>	
6	
7	It is unclear whether Measures 2 and 3 were prematurely screened out due to a lack of consideration of Objective 1c in the initial screening rationale.
8	
9	

**Table ES-1. Overview of 13 Final Panel Comments Identified by the South Central Coast FS IEPR Panel (continued)**

No.	Final Panel Comment
<b>Significance – Low</b>	
10	The TSP does not consistently address planning goals/objectives or adequately relate the planning goals/objectives to the TSP.
11	The assessment of impacts does not clearly discern which impacts are direct, indirect, and cumulative.
12	
13	

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## LIST OF ACRONYMS

<b>ADM</b>	Agency Decision Milestone
<b>AEP</b>	Annual Exceedance Probability
<b>ASCE</b>	American Society of Civil Engineers
<b>ASDSO</b>	Association of State Dam Safety Officials
<b>ATR</b>	Agency Technical Review
<b>BCR</b>	Benefit-Cost Ratio
<b>CAA</b>	Clean Air Act
<b>CDOT</b>	Colorado Department of Transportation
<b>CE</b>	Categorical Exclusion
<b>COI</b>	Conflict of Interest
<b>CSRM</b>	Coastal Storm Risk Management
<b>CWA</b>	Clean Water Act
<b>DDR</b>	Design Documentation Report
<b>DEP</b>	Department of Environmental Protection
<b>DrChecks</b>	Design Review and Checking System
<b>DSMS</b>	Dam Safety Modification Study
<b>EA</b>	Environmental Assessment
<b>EAD</b>	Expected Annual Damages
<b>EC</b>	Engineer Circular
<b>EIS</b>	Environmental Impact Statement
<b>EJ</b>	Environmental Justice
<b>EM</b>	Engineer Manual
<b>EOC</b>	End of Construction
<b>ER</b>	Engineer Regulation
<b>ERDC</b>	Engineer Research and Development Center
<b>ESA</b>	Endangered Species Act
<b>ETL</b>	Engineer Technical Letter
<b>FDA</b>	Flood Damage Reduction Analysis
<b>FEMA</b>	Federal Emergency Management Agency
<b>FoS</b>	Factor of Safety

<b>FS</b>	Feasibility Study
<b>FWCA</b>	Fish and Wildlife Coordination Act
<b>GIS</b>	Geographic Information System
<b>H&amp;H</b>	Hydrology and Hydraulic
<b>HART</b>	Hawai'i, Authority for Rapid Transportation
<b>HEC</b>	Hydrologic Engineering Center
<b>HRTTP</b>	Honolulu Rail Transit Project
<b>IEPR</b>	Independent External Peer Review
<b>IWR</b>	Institute for Water Resources
<b>NED</b>	National Economic Development
<b>NEPA</b>	National Environmental Policy Act
<b>NHPA</b>	National Historic Preservation Act
<b>NWR</b>	National Wildlife Refuge
<b>NYC</b>	New York City
<b>O&amp;M</b>	Operation and Management
<b>OEO</b>	Outside Eligible Organization
<b>OMB</b>	Office of Management and Budget
<b>OPSEC</b>	Operations Security
<b>PA</b>	Programmatic Agreement
<b>PCX</b>	Planning Center of Expertise
<b>PDT</b>	Project Delivery Team
<b>PMF</b>	Probable Maximum Flood
<b>QA</b>	Quality Assurance
<b>RAS</b>	River Analysis System
<b>RSLR</b>	Relative Sea Level Rise
<b>SAME</b>	Society of American Military Engineers
<b>SAR</b>	Safety Assurance Review
<b>TSP</b>	Tentatively Selected Plan
<b>USACE</b>	United States Army Corps of Engineers
<b>USBR</b>	U.S. Bureau of Reclamation
<b>USFWS</b>	United States Fish and Wildlife Service
<b>WCG</b>	Water at Construction Grade

**WMA** Wildlife Management Area

**WVA** Wetland Value Assessment

## 1. INTRODUCTION

Hurricanes, riverine flooding, rainfall, and tropical storms pose a significant risk to the communities, ecosystems, and industries of the Louisiana gulf coast. Approximately 177,000 people reside within the study area for the South Central Coast Louisiana, Feasibility Study (FS). The area has suffered from disasters and will continue to suffer from natural disasters without some form of Coastal Storm Risk Management (CSRМ) solution. Repeated storm events (including Hurricanes Andrew, Rita, Gustav, and Ike, which made landfall affecting the entire study area) resulted in economic damages to structures and properties, wildlife and property, and repeated mandatory evacuation costs. Emergency declarations have been declared in 22 of the last 30 years, due to coastal storm or riverine flooding damages. This area is also vulnerable to coastal land loss and degradation, reducing the natural resiliency of the area to storm surge and flood attenuation. From 1932 to 2010, the area experienced a net loss of approximately 22,500 acres of wetlands. The continuous wetlands losses impact migratory species, the ecological nurseries of the Gulf of Mexico, and various commercial and recreational activities.

The study area comprises ecosystems having national significance as demonstrated by the presence of Bayou Teche National Wildlife Refuge (NWR), the State of Louisiana Marsh Island Wildlife Refuge, the Attakapas and Atchafalaya Delta Wildlife Management Areas (WMAs), and the Federal authorizations and implementation of the U.S. Army Corps of Engineers (USACE) Mississippi River and Tributaries project, the USACE Atchafalaya Basin Floodway System, the multi-Federal agency Coastal Wetlands Planning, Protection and Restoration Act program, and by the USACE Louisiana Coastal Area program. The Atchafalaya Basin is unique because it has a growing delta system. Designated by Congress in 2006 as a National Heritage Area, the Atchafalaya Basin has significant cultural, historic, scenic, and recreational resources. It is the nation's largest alluvial bottomland and swamp, providing habitat for 24 Federal- and state-listed threatened or endangered species, or species of concern such as Louisiana black bear, brown pelicans, and bald eagles. About 22 million pounds of crawfish are commercially harvested annually from the basin.

The area also includes many industries with national significance, including the carbon black manufacturing plants of Cabot Corporation, Columbian Chemicals, and Degussa Engineered Carbons. These plants are among the largest carbon black producers in the United States. The area is a hub for ship building and fabricating, oil and gas services, and extraction industries vital to the U.S. economy. The Strategic Petroleum Reserve maintains storage facilities immediately north and west of the study area, with transfer and processing infrastructure traversing the area. Numerous Federal lands and water resources investment programs are active in the study area. In addition, Congress, in Section 906 (e) and (f) of the Water Resources Development Act of 1986, enacted legislation that designated fish and wildlife enhancement within the Lower Atchafalaya Basin Floodway as having national significance.

South Central Coast FS residents are currently at risk primarily from coastal storms. The project area consists of approximately 75,263 structures above the ground surface valued at \$18.6 billion. Residential and non-residential structures are raised on average 1 to 2 feet. Current Federal projects are largely constructed on the eastern edge of the study area. The existing Atchafalaya Basin Floodway System was authorized to address riverine flooding from the Atchafalaya River Basin and was not designed to address coastal storm surge occurring from tropical storm events.

The study area suffers from the highest relative sea level rise (RSLR) in the country. Sea level rise at moderate- and high-level projections would result in loss of Marsh Island, further loss of barrier islands

like Rabbit and Duck Key, and loss of marsh habitat in the project area. Loss of remaining barrier islands and marsh habitat would allow storm surge and damages to occur farther up into the human settlements within St. Martin, St. Mary, and Iberia Parishes. Impacts of storm events could increase with increasing RSLR.

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. The objective of the work described here was to conduct an Independent External Peer Review (IEPR) of the South Central Coast, Louisiana, Feasibility Study (hereinafter: South Central Coast FS IEPR) in accordance with procedures described in the Department of the Army, USACE, Engineer Circular (EC) *Review Policy for Civil Works* (EC 1165-2-217) (USACE, 2018) and the Office of Management and Budget (OMB), *Final Information Quality Bulletin for Peer Review* (OMB, 2004). Supplemental guidance on evaluation for conflicts of interest (COIs) was obtained from the *Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports* (The National Academies, 2003).

This final report presents the Final Panel Comments of the IEPR Panel (the Panel) on the existing engineering, economic, environmental, and plan formulation analyses contained in the South Central Coast FS IEPR documents (Section 4). Appendix A describes in detail how the IEPR was planned and conducted, including the schedule followed in executing the IEPR. Appendix B provides biographical information on the IEPR panel members and describes the method Battelle followed to select them. Appendix C presents the final charge to the IEPR panel members for their use during the review; the final charge was submitted to USACE in the final Work Plan according to the schedule listed in Table A-1. Appendix D presents the organizational COI form that Battelle completed and submitted to the Institute for Water Resources (IWR) prior to the award of the South Central Coast FS IEPR.

## **2. PURPOSE OF THE IEPR**

To ensure that USACE documents are supported by the best scientific and technical information, USACE has implemented a peer review process that uses IEPR to complement the Agency Technical Review, as described in USACE (2018).

In general, the purpose of peer review is to strengthen the quality and credibility of the USACE decision documents in support of its Civil Works program. IEPR provides an independent assessment of the engineering, economic, environmental, and plan formulation analyses of the project study. In particular, the IEPR addresses the technical soundness of the project study's assumptions, methods, analyses, and calculations and identifies the need for additional data or analyses to make a good decision regarding implementation of alternatives and recommendations.

In this case, the IEPR of the South Central Coast FS was conducted and managed using contract support from Battelle, which is an Outside Eligible Organization (OEO) (as defined by EC 1165-2-217). Battelle, a 501(c)(3) organization under the U.S. Internal Revenue Code, has experience conducting IEPRs for USACE.

## **3. METHODS FOR CONDUCTING THE IEPR**

The methods used to conduct the IEPR are briefly described in this section; a detailed description can be found in Appendix A. The IEPR was completed in accordance with established due dates for milestones

and deliverables as part of the final Work Plan; the due dates are based on the award/effective date and the receipt of review documents.

Battelle identified, screened, and selected five panel members to participate in the IEPR based on their expertise in the following disciplines: plan formulation/economics, environmental law compliance/cultural resources, hydrology and hydraulic (H&H) engineering, civil engineering, and geotechnical engineering. The Panel reviewed the South Central Coast FS documents and produced 13 Final Panel Comments in response to 16 charge questions provided by USACE for the review. This charge also included two overview questions and one public comment question added by Battelle, for a total of 19 questions. Battelle instructed the Panel to develop the Final Panel Comments using a standardized four-part structure:

1. Comment Statement (succinct summary statement of concern)
2. Basis for Comment (details regarding the concern)
3. Significance (high, medium/high, medium, medium/low, or low; in accordance with specific criteria for determining level of significance)
4. Recommendation(s) for Resolution (at least one implementable action that could be taken to address the Final Panel Comment).

Battelle reviewed all Final Panel Comments for accuracy, adherence to USACE guidance (EC 1165-2-217), and completeness prior to determining that they were final and suitable for inclusion in the Final IEPR Report. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The Panel's findings are summarized in Section 4.1; the Final Panel Comments are presented in full in Section 4.2.

## 4. RESULTS OF THE IEPR

This section presents the results of the IEPR. A summary of the Panel's findings and the full text of the Final Panel Comments are provided.

### 4.1 Summary of Final Panel Comments

The panel members agreed on their "assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used" (USACE, 2018) in the South Central Coast FS/Environmental Impact Statement (EIS). The following summarizes the Panel's findings.

Based on the Panel's review, the report is well-written, concise, and provides supporting documentation on most engineering, environmental, economic, and plan formulation issues. In general, the Panel believes the project and review documents addressed a difficult problem with limited potential effective alternatives available to choose from. However, the Panel identified several technical elements of the project formulation where additional analysis is warranted and places where project findings and objectives need to be documented or clarified.

**Plan Formulation:** The Panel understands that the area under assessment has limited structural and non-structural alternatives available for consideration. However, based on the information provided, some concerns remain regarding the measures and alternatives considered in the plan formulation. The Panel's first concern is that Measures 2 and 3 were prematurely screened out due to a lack of consideration of Objective 1c in the initial screening. Without considering evacuation benefits from the very beginning, it is

unclear whether these measures that specifically addressed Objective 1c would have successfully moved forward if they had not already been screened out in the initial screening.

The Panel also noted that an alternative which combines elevating some structures with acquisition and relocation of other structures was not considered. The Panel believes that combining these two methods of addressing the flood risk and life safety elements may lead to a higher benefit-cost ratio (BCR) than each measure on its own.

Finally, for the South Central Coast FS/EIS to be complete, the Panel believes that additional documentation is needed regarding the assumption that 100% of homeowners or property owners would participate in voluntary structure-raising and floodproofing. During discussions, USACE stated that lower participation would result in lower costs but would not result in a different Tentatively Selected Plan (TSP). However, by clearly documenting whether USACE truly believes 100% participation is realistically feasible, the South Central Coast FS/EIS would present a clearer understanding of the residual risks. The Panel also believes that the South Central Coast FS/EIS needs to clearly document the level of tolerable residual risk that would remain after implementation of the TSP. From the information provided, the Panel believes the residual risk is higher than the overall decrease in expected annual losses covered by the TSP.

**Engineering:** The Panel noted several aspects of the engineering documentation that need clarification. With regard to levee design, the Panel is unclear why a Factor of Safety (FoS) of 1.2 was chosen where breaching could lead to inundation. This is lower than the FoS that is normally suggested in these instances by USACE Engineer Manual (EM) 1110-2-1913. The Panel also does not understand why the advantages and benefits of staged construction were not maximized, considering that staged construction would result in lower quantities of levee embankment being needed and lower levee costs.

The Panel could not find information on the effectiveness of the 3-foot above-grade floodproofing criteria for non-residential buildings. From the information provided, these criteria may be ineffective at reducing flood risk for the required 1% annual exceedance probability (AEP) design event considering RSLR and storm surge over the 50-year project performance period. Including information on the effectiveness of these actions will help further explain the effectiveness of the TSP. The Panel also believes that more information on preliminary design and costs for floodproofing of nationally significant non-residential structures is needed. If included in the benefit-cost analyses, could result in a TSA that includes additional structures within the 50-year or 100-year storm surge floodplain.

**Economics:** The Panel believes that the report would be more complete and TSP selection would be substantiated if the National Economic Development (NED) benefits associated with reduction of life safety, nationally significant industries, and evacuation/reoccupation were quantified and included in the BCR. Quantification of NED benefits may substantially elevate the BCR of measures which were screened early in the plan formation process.

**Environmental:** From the National Environmental Policy Act (NEPA) and cultural resources perspective, the Panel noted that the South Central Coast FS/EIS and associated appendices are generally very well presented for this phase of the project. However, the documents would be strengthened by providing additional information on the potential for environmental impacts, including life safety hazards, and for flooding impacts on non-participants, minority or low-income groups, and heritage areas and ecosystems of national significance that are present in the study area. The Panel also found that several of the impacts described were not defined as direct, indirect, or cumulative impacts, as required by NEPA.

## 4.2 Final Panel Comments

This section presents the full text of the Final Panel Comments prepared by the IEPR panel members.

### Final Panel Comment 1

#### Basis for Comment

#### Significance – Medium/High

#### Recommendations for Resolution

1. Provide additional tables and figures to clearly document the surge depths for Measure 11 and the TSP in the South Central Coast FS/EIS.
2. Update the floodproofing criteria to clearly distinguish the eligibility parameters for wet and dry floodproofing of non-residential structures.
3. Evaluate existing ground elevation relative to the aggregate of RSLR and surge depth for the purpose of identifying locations where the depth of flooding is less than 3 feet above grade.

### Final Panel Comment 1

Non-residential structures in these areas would be eligible for dry floodproofing. Non-residential structures outside the 3-foot flood depth areas would be eligible for wet floodproofing.

4. Evaluate and screen non-residential structures which would not receive effective 1% AEP flood damage risk reduction from 3 feet of floodproofing over the 50-year project performance period.
5. Revise the benefit and cost calculations to exclude non-residential structures which were eliminated from eligibility for dry floodproofing. Modified benefit and cost calculations may be required if wet floodproofing of non-residential structures is selected as an alternative.

### Literature Cited

FEMA (2013). Floodproofing Non-Residential Buildings. Federal Emergency Management Agency, FEMA P-936. July 2013.

ASCE (2006). Flood Resistant Design and Construction. American Society of Civil Engineers/Structural Engineering Institute Standard ASCE/SEI 24-05. Published online March 2013. Available at <https://ascelibrary.org/doi/10.1061/9780784408186.fm>.

**Final Panel Comment 2**

**Basis for Comment**

**Significance – Medium/High**

**Recommendation for Resolution**

1. Calculate and document the costs and benefits for an alternative that provides for the acquisition and relocation of structures to be raised 6 feet or higher, and elevation of structures to be raised less than 6 feet.

### Final Panel Comment 3

#### Basis for Comment

The South Central Coast FS/EIS (p. 10) notes that the weight of the levee fill during the initial stages of

#### Significance – Medium/High

#### Recommendations for Resolution

1. Modify the geometry of the lifts to maximize the benefit of staged levee construction.
2. Perform preliminary cost evaluations to determine whether a less conservative levee cross-section (e.g., 1V:3H) can significantly affect its BCR.
3. In cases where staged construction can significantly affect the BCR, revise the levee stability analyses and the levee cross-section geometry, taking into consideration the increased foundation strength due to soil consolidation occurring under the weight of previously placed lifts.

## Final Panel Comment 4

### Basis for Comment

### Significance – Medium

### Recommendations for Resolution

1. Provide a discussion and quantification of tolerable risk for the TSP is recommended prior to the pre-engineering design phase.

#### Final Panel Comment 4

2. Describe within the South Central Coast FS/EIS, the number of at-risk structures (both residential and non-residential) that would benefit from the various structural storm surge solution alternatives.
3. Provide additional clarification and interpretation of the areal extent in EAD reductions presented in Figure 8 of Appendix D (Economics) and describe how these results satisfy key project goals.
4. Verify that the maximum depth of flooding is primarily less than 2 feet for structures in the 25-year TPS non-structural project (refer to South Central Coast FS/EIS, Figure ES-3, p. xii).
5. Resolve the contradictory statements in Appendix D (Economics) related to the effectiveness of the TSP.

## Final Panel Comment 5

### Basis for Comment

### Significance – Medium

### Recommendations for Resolution

1. Clarify why these specific assets were not included in the TSP evaluation and whether floodproofing and otherwise protecting these key infrastructure facilities will be assessed during supplemental feasibility or pre-engineering design phases.
2. Conduct a limited (sensitivity analysis) benefit-cost evaluation of non-structural alternatives that incorporate some specific floodproofing of key non-residential infrastructure assets.

## Final Panel Comment 6

### Basis for Comment

### Significance – Medium/Low

### Recommendations for Resolution

1. Identify in the South Central Coast FS/EIS which measures would provide benefits to the nationally significant industries.
2. Quantify benefits associated with maintaining Highway 90 as a key evacuation route.
3. Quantify benefits associated with providing flood risk reduction to nationally significant industries. This may include both direct and indirect benefits.
4. Quantify benefits associated with reduction of risk to loss of life.

### Final Panel Comment 6

5. Document quantification of benefits in the South Central Coast FS/EIS. Discuss methodology, assumptions, and confidence level.
6. Recalculate the BCR for measures that address Goal 1 objectives.
7. Update the South Central Coast FS/EIS with revisions to affected measures.

## Final Panel Comment 7

### Basis for Comment

### Significance – Medium/Low

### Recommendations for Resolution

1. Re-evaluate all measures based on the correct project goals and objectives.
2. Determine if measures screened out during iterations 1 and 2 should have been moved forward for further consideration.
3. Revise Table 3-6 to report the correct project goals and objectives, and adjust the reported scores, discussion, and decisions for each measure.
4. Evaluate and provide supporting documentation for any measures that are moved forward as a result of the correction to the screening criteria.

**Final Panel Comment 8**

**Basis for Comment**

**Significance – Medium/Low**

**Recommendations for Resolution**

1. Select a FoS of at least 1.3 for levee slope stability for the WCG condition.
2. Discuss the rationale for selection of the slope stability FoSs for the various conditions considered.

## Final Panel Comment 9

### Basis for Comment

### Significance – Medium/Low

### Recommendations for Resolution

1. Include a brief discussion in the South Central Coast FS/EIS (the Executive Summary and Section 7) on the range of possible participation. Build this discussion based on the results available from the very similar Southwest Coastal Louisiana project, to the extent possible. Showing a 25%, 50%, and 75% range of participation, or something similar, would be useful. Tie this to expected annual benefits and the BCR. If there is a threshold at which the BCR drops to less than 1, this would suggest that the TSP should be revisited.
2. Add this discussion to Section 7.2, Risk and Uncertainty, as it is an additional risk.
3. Conduct a more in-depth sensitivity analysis during the next phase of the project.

## Final Panel Comment 10

### Basis for Comment

The Executive Summary includes four PDT-identified planning objectives (numbered 1-4) that are restated in Section 1.7 with different numbering (1a, 1b, 1c, and 2.)

The planning goals/objectives are identified in Section 1.7 (p. 11) of the South Central Coast FS/EIS as:

- Goal 1: Increase sustainability and resiliency of communities to coastal flood events.
  - Objective 1a. Reduce risk to life safety from hurricanes and storm surge flooding.
  - Objective 1b. Reduce economic loss/damages, as a result of hurricanes and storm surge flooding to structures (i.e., residential, commercial, agricultural, and industrial) within the study area.
  - Objective 1c. Maintain availability of key evacuation route (Highway 90) for residents within the study area and the greater New Orleans area.
- Goal 2: Maintain and sustain the resiliency of natural ecosystem to reduce flood damages.
  - Objective 2a. Minimize degradation to vulnerable coastal habitat and wetland areas.

Tables 3-3 and 3-4 reword the goals/objectives from Section 1.7 (p. 11), creating confusion.

Table 3-6 includes four objectives, using the Section 1.7 wording for Objectives 1a and 1b, and expands Goal 2 into Objectives 2a and 2b. The Highway 90 Objective 1c disappears prematurely and is an alternative that is screened from further consideration per Table 3-6.

Section 4.2, Table 4-2 (p. 96) describes South Central Coast FS objectives using the same objectives from Section 1.7. This table is presented as validation for selection of the TSP (Alternative 1) based on net benefit calculations. Although the table provides a qualitative comment for each objective, the Panel was not able to make the connection between net benefit calculations and the evaluation of effectiveness of the TSP in addressing Objectives 1a, 1c, or 2a (or 2b).

### Significance – Low

The various discussions on project goals and objectives are inconsistent and create confusion. The TSP is not required to meet all the objectives; however, the discussion does not clarify that. As a result, net benefit calculations effectively address the accomplishment of Objective 1b, but not Objectives 1a, 1c, or 2a (or 2b).

## Final Panel Comment 10

### Recommendations for Resolution

1. Match up the goals and objectives throughout the report.
2. Revise Table 3-6 to include Objective 1c in the top column.
3. Explain in Section 4 that the TSP is not required to meet all of the goals and objectives.
4. Explain in Section 4 how net benefit calculations address the effectiveness of the TSP in accomplishing Objectives 1a, 1c, and 2a; or explain why the objectives do not need to be met, per Recommendation 3 above.
5. Remove the mitigation of wetlands as an objective, if it was not funded.

**Final Panel Comment 11**

**Basis for Comment**

**Significance – Low**

**Recommendation for Resolution**

1. Clearly identify and distinguish the difference between direct and indirect impacts for each resource. If cumulative impacts are to be presented in a separate section, limit their presentation to that section.

**Final Panel Comment 12**

**Basis for Comment**

**Significance – Low**

**Recommendations for Resolution**

1. Expand project documentation to show the correlation between the study area population (177,000, or approximately 70,000 households), residential single-family and multi-family structure totals, commercial structures, public buildings, warehouse totals, and the total potential

### Final Panel Comment 12

flood-impacted structures in the study area. Once shown, identify the EJ populations associated with these structures. The Panel assumes these data are available and could be included in a table or tables.

2. Identify non-Federal partner and state/local resources that are available to provide funding assistance for low-income/minority property owners associated with the TSP, or indicate if no such resources are available.

### Literature Cited

Executive Order 12898 (February 11, 1994). Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Federal Register Vol. 59, No. 32.

### Final Panel Comment 13

#### Basis for Comment

#### Significance – Low

#### Recommendations for Resolution

1. Acknowledge the NWR and WMAs in Chapter 2 as being designated “ecosystems having national significance” rather than recreation areas.
2. Add a brief statement regarding these resources to Table 6-4 of the South Central Coast FS/EIS, Summary of Cumulative Impacts, Recreation Resources.
3. Add a possible location in Section 5 for a discussion of these resources (would be Section 5.2.12 [note: typo shows this as 5.1.12]).

## 5. REFERENCES

ASCE (2006). Flood Resistant Design and Construction. American Society of Civil Engineers/Structural Engineering Institute Standard ASCE/SEI 24-05. Published online March 2013. Available at <https://ascelibrary.org/doi/10.1061/9780784408186.fm>.

Executive Order 12898 (February 11, 1994). Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Federal Register Vol. 59, No. 32.

FEMA (2013). Floodproofing Non-Residential Buildings. Federal Emergency Management Agency, FEMA P-936. July 2013.

OMB (2004). Final Information Quality Bulletin for Peer Review. Executive Office of the President, Office of Management and Budget, Washington, D.C. Memorandum M-05-03. December 16.

The National Academies (2003). Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports. The National Academies (National Academy of Science, National Academy of Engineering, Institute of Medicine, National Research Council). May 12.

USACE (2018). Water Resources Policies and Authorities: Review Policy for Civil Works. Engineer Circular (EC) 1165-2-217. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. February 20.

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# APPENDIX A

IEPR Process for the South Central Coast FS Project

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## A.1 Planning and Conduct of the Independent External Peer Review (IEPR)

Table A-1 presents the major milestones and deliverables of the Independent External Peer Review (IEPR) of the South Central Coast Feasibility Study (hereinafter: South Central Coast FS IEPR). Due dates for milestones and deliverables are based on the award/effective date listed in Table A-1. The review documents were provided by U.S. Army Corps of Engineers (USACE) on November 18, 2019. Note that the actions listed under Task 6 occur after the submission of this report. Battelle anticipates submitting the pdf printout of the USACE's Design Review and Checking System (DrChecks) project file (the final deliverable) on April 7, 2020. The actual date for contract end will depend on the date that all activities for this IEPR are conducted and subsequently completed.

**Table A-1. Major Milestones and Deliverables of the South Central Coast FS IEPR**

Task	Action	Due Date
1	Award/Effective Date	9/11/2019
	Review documents available	11/18/2019
	Public comments available	1/13/2020
	Battelle submits draft Work Plan <sup>a</sup>	9/20/2019
	USACE provides comments on draft Work Plan	9/26/2019
	Battelle submits final Work Plan <sup>a</sup>	10/3/2019
2	Battelle submits list of selected panel members <sup>a</sup>	10/2/2019
	USACE confirms the panel members have no COI	10/7/2019
3	Battelle convenes kick-off meeting with USACE	9/16/2019
	Battelle convenes kick-off meeting with panel members	11/19/2019
	Battelle convenes kick-off meeting with USACE and panel members	11/19/2019
4	Panel members complete their individual reviews	12/20/2019
	Panel members provide draft Final Panel Comments to Battelle	1/10/2020
	Battelle sends public comments to panel members for review	1/15/2020
	Panel confirms no additional Final Panel Comment is necessary with regard to the public comments	1/22/2020
	Panel finalizes Final Panel Comments	1/24/2020
5	Battelle submits Final IEPR Report to USACE <sup>a</sup>	2/3/2020
6 <sup>b</sup>	Battelle convenes Comment Response Teleconference with panel members and USACE	3/23/2020
	Battelle submits pdf printout of DrChecks project file <sup>a</sup>	4/7/2020
	Agency Decision Milestone (ADM) meeting <sup>c</sup>	3/27/2020
	Contract End/Delivery Date	10/30/2020

<sup>a</sup> Deliverable.

<sup>b</sup> Task 6 occurs after the submission of this report.

<sup>c</sup> The ADM meeting was listed in the Performance Work Statement under Task 3 but was relocated in this schedule to reflect the chronological order of activities.

At the beginning of the Period of Performance for the South Central Coast FS IEPR, Battelle held a kick-off meeting with USACE to review the preliminary/suggested schedule, discuss the IEPR process, and address any questions regarding the scope (e.g., terminology to use, access to DrChecks, etc.). Any revisions to the schedule were submitted as part of the final Work Plan. The final charge consisted of 16 charge questions provided by USACE, two overview questions and one public comment question added by Battelle (all questions were included in the draft and final Work Plans), and general guidance for the Panel on the conduct of the peer review (provided in Appendix C of this final report).

Prior to beginning their review and after their subcontracts were finalized, all the members of the Panel attended a kick-off meeting via teleconference planned and facilitated by Battelle in order to review the IEPR process, the schedule, communication procedures, and other pertinent information for the Panel. Battelle planned and facilitated a second kick-off meeting via teleconference, during which USACE presented project details to the Panel. Before the meetings, the IEPR Panel received an electronic version of the final charge, as well as the review documents and reference/supplemental materials listed in Table A-2.

**Table A-2. Documents to Be Reviewed and Provided as Reference/Supplemental Information**

Review Documents	No. of Review Pages
South Central Coast Feasibility Study	128
Economics	50
Plan Formulation	100
Other Social Effects	9
Public Review Comments <sup>a,b</sup>	17
Supplemental Information	
Risk Register	4

<sup>a</sup> Supporting documentation only. These documents are not for Panel review and should be used as information sources only. They are not included in the total page count.

<sup>b</sup> USACE will submit public comments to Battelle upon their availability according to the schedule in Table A-1. Battelle will in turn submit the comments to the IEPR Panel for review.

In addition to the materials provided in Table A-2, the panel members were provided the following USACE guidance documents.

- Review Policy for Civil Works (EC 1165-2-217, February 20, 2018)
- Office of Management and Budget's Final Information Quality Bulletin for Peer Review (December 16, 2004)
- Foundations of SMART Planning
- Feasibility Study Milestones (PB 2018-01, September 30, 2018 and PB 2018-01(S), June 20, 2019)
- SMART – Planning Overview
- Planning Modernization Fact Sheet
- USACE Climate Change Adaptation Plan (2015)
- Procedures to Evaluate SLR Change Impacts Responses Adaptation (ETL 1100-2-1 – June 30, 2014)
- Incorporating SLR Change in CW Programs (ER 1100-2-8162 – December 31, 2013).

About halfway through the review, a teleconference was held with USACE, Battelle, and the Panel so that USACE could answer any questions the Panel had concerning either the review documents or the project. Prior to this teleconference, Battelle submitted 25 panel member questions to USACE. USACE was able to provide responses to all the questions during the teleconference, and was able to provide written responses to all the questions prior to the end of the review.

In addition, throughout the review period, USACE provided documents at the request of panel members. These documents were provided to Battelle and then sent to the Panel as additional information only and were not part of the official review. A list of these additional documents requested by the Panel is provided below.

- Louisiana Coastal Protection and Restoration Final Technical Report (June 2009).

## **A.2 Review of Individual Comments**

The Panel was instructed to address the charge questions/discussion points within a charge question response form provided by Battelle. At the end of the review period, the Panel produced individual comments in response to the charge questions/discussion points. Battelle reviewed the comments to identify overall recurring themes, areas of potential conflict, and other overall impressions. At the end of the review, Battelle summarized the individual comments into a preliminary list of overall comments and discussion points. Each panel member's individual comments were shared with the full Panel.

## **A.3 IEPR Panel Teleconference**

Battelle facilitated a teleconference with the Panel so that the panel members could exchange technical information. The main goal of the teleconference was to identify which issues should be carried forward as Final Panel Comments in the Final IEPR Report and decide which panel member should serve as the lead author for the development of each Final Panel Comment. This information exchange ensured that the Final IEPR Report would accurately represent the Panel's assessment of the project, including any conflicting opinions. The Panel engaged in a thorough discussion of the overall positive and negative comments, added any missing issues of significant importance to the findings, and merged any related

individual comments. At the conclusion of the teleconference, Battelle reviewed each Final Panel Comment with the Panel, including the associated level of significance, and confirmed the lead author for each comment.

#### A.4 Preparation of Final Panel Comments

Following the teleconference, Battelle distributed a summary memorandum for the Panel documenting each Final Panel Comment (organized by level of significance). The memorandum provided the following detailed guidance on the approach and format to be used to develop the Final Panel Comments for the South Central Coast FS IEPR:

- **Lead Responsibility:** For each Final Panel Comment, one panel member was identified as the lead author responsible for coordinating the development of the Final Panel Comment and submitting it to Battelle. Battelle modified lead assignments at the direction of the Panel. To assist each lead in the development of the Final Panel Comments, Battelle distributed a summary email detailing each draft final comment statement, an example Final Panel Comment following the four-part structure described below, and templates for the preparation of each Final Panel Comment.
- **Directive to the Lead:** Each lead was encouraged to communicate directly with the other panel members as needed and to contribute to a particular Final Panel Comment. If a significant comment was identified that was not covered by one of the original Final Panel Comments, the appropriate lead was instructed to draft a new Final Panel Comment.
- **Format for Final Panel Comments:** Each Final Panel Comment was presented as part of a four-part structure:
  1. Comment Statement (succinct summary statement of concern)
  2. Basis for Comment (details regarding the concern)
  3. Significance (high, medium/high, medium, medium/low, and low; see description below)
  4. Recommendation(s) for Resolution (see description below).
- **Criteria for Significance:** The following were used as criteria for assigning a significance level to each Final Panel Comment:
  1. **High:** There is a fundamental issue within study documents or data that will influence the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.
  2. **Medium/High:** There is a fundamental issue within study documents or data that has a strong probability of influencing the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.
  3. **Medium:** There is a fundamental issue within study documents or data that has a low probability of influencing the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.

4. **Medium/Low:** There is missing, incomplete, or inconsistent technical or scientific information that affects the clarity, understanding, or completeness of the study documents, and there is uncertainty whether the missing information will affect the selection of, justification of, or ability to implement the recommended plan.
  5. **Low:** There is a minor technical or scientific discrepancy or inconsistency that affects the clarity, understanding, or completeness of the study documents but does not influence the selection of, justification of, or ability to implement the recommended plan.
- Guidelines for Developing Recommendations: The recommendation section was to include specific actions that USACE should consider to resolve the Final Panel Comment (e.g., suggestions on how and where to incorporate data into the analysis, how and where to address insufficiencies, areas where additional documentation is needed).

Battelle reviewed and edited the Final Panel Comments for clarity, consistency with the comment statement, and adherence to guidance on the Panel’s overall charge, which included ensuring that there were no comments regarding either the appropriateness of the selected alternative or USACE policy. At the end of this process, 13 Final Panel Comments were prepared and assembled. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The full text of the Final Panel Comments is presented in Section 4.2 of the main report.

## A.5 Conduct of the Public Comment Review

Following the schedule in Table A-1, Battelle received a PDF file containing 17 pages of public comments on the South Central Coast FS/Environmental Impact Statement (EIS) from USACE. Battelle then sent the public comments to the panel members in addition to the following charge question:

1. **Do the public comments raise any additional discipline-specific technical concerns with regard to the overall report?**

The Panel produced individual comments in response to the charge question. Each panel member’s individual comments for the public comment review were shared with the full Panel. Battelle reviewed the comments to identify any new technical concerns that had not been previously identified during the initial IEPR. Upon review, Battelle determined and the Panel confirmed that no new issues or concerns were identified other than those already covered in the Final Panel Comments.

## A.6 Final IEPR Report

After concluding the review and preparation of the Final Panel Comments, Battelle prepared a final IEPR report (this document) on the overall IEPR process and the IEPR panel members’ findings. Each panel member and Battelle technical and editorial reviewers reviewed the IEPR report prior to submission to USACE for acceptance.

## A.7 Comment Response Process

As part of Task 6, Battelle will enter the 13 Final Panel Comments developed by the Panel into USACE’s DrChecks, a Web-based software system for documenting and sharing comments on reports and design documents, so that USACE can review and respond to them. USACE will provide responses (Evaluator Responses) to the Final Panel Comments, and the Panel will respond (BackCheck Responses) to the

Evaluator Responses. All USACE and Panel responses will be documented by Battelle. Battelle will provide USACE and the Panel a pdf printout of all DrChecks entries, through comment closeout, as a final deliverable and record of the IEPR results.

# APPENDIX B

Identification and Selection of IEPR Panel Members for the South Central Coast FS Project

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## B.1 Panel Identification

The candidates for the Independent External Peer Review (IEPR) of the South Central Coast, Louisiana, Feasibility Study (hereinafter: South Central Coast FS IEPR) Panel were evaluated based on their technical expertise in the following key areas: plan formulation/economics, environmental law compliance/cultural resources, hydrology and hydraulic (H&H) engineering, civil engineering, and geotechnical engineering. These areas correspond to the technical content of the review documents and overall scope of the South Central Coast FS project.

To identify candidate panel members, Battelle reviewed the credentials of the experts in Battelle's Peer Reviewer Database, sought recommendations from colleagues, contacted former panel members, and conducted targeted Internet searches. Battelle evaluated these candidate panel members in terms of their technical expertise and potential conflicts of interest (COIs). Of these candidates, Battelle chose the most qualified individuals, confirmed their interest and availability, and ultimately selected five experts for the final Panel. The remaining candidates were not proposed for a variety of reasons, including lack of availability, disclosed COIs, or lack of the precise technical expertise required.

Candidates were screened for the following potential exclusion criteria or COIs. These COI questions were intended to serve as a means of disclosure in order to better characterize a candidate's employment history and background. Battelle evaluated whether scientists in universities and consulting firms that are receiving USACE-funding have sufficient independence from USACE to be appropriate peer reviewers. Guidance in OMB (2004, p. 18) states,

“...when a scientist is awarded a government research grant through an investigator-initiated, peer-reviewed competition, there generally should be no question as to that scientist's ability to offer independent scientific advice to the agency on other projects. This contrasts, for example, to a situation in which a scientist has a consulting or contractual arrangement with the agency or office sponsoring a peer review. Likewise, when the agency and a researcher work together (e.g., through a cooperative agreement) to design or implement a study, there is less independence from the agency. Furthermore, if a scientist has repeatedly served as a reviewer for the same agency, some may question whether that scientist is sufficiently independent from the agency to be employed as a peer reviewer on agency-sponsored projects.”

The term “firm” in a screening question referred to any joint venture in which a firm was involved. It applied to any firm that serves in a joint venture, either as a prime or as a subcontractor to a prime. Candidates were asked to clarify the relationship in the screening questions.

### Panel Conflict of Interest (COI) Screening Questionnaire for the IEPR of the South Central Coast, Louisiana, Feasibility Study

1. Previous and/or current involvement by you or your firm in the South Central Coast, Louisiana, Feasibility Study (hereinafter: South Central Coast FS) and related projects.
2. Previous and/or current involvement by you or your firm in flood control, and Atchafalaya Basin.

## Panel Conflict of Interest (COI) Screening Questionnaire for the IEPR of the South Central Coast, Louisiana, Feasibility Study

3. Previous and/or current involvement by you or your firm in the conceptual or actual design, construction, or operation and maintenance (O&M) of any projects in the South Central Coast FS or related projects.
4. Current employment by the U.S. Army Corps of Engineers (USACE).
5. Previous and/or current involvement with paid or unpaid expert testimony related to the South Central Coast FS project.
6. Previous and/or current employment or affiliation with the non-Federal sponsors or any of the following cooperating Federal, State, County, local and regional agencies, environmental organizations, and interested groups (*for pay or pro bono*):
  - Coastal Protection and Restoration Authority Board of Louisiana
  - Iberia, St. Martin, and St. Mary parishes
  - City of Breaux Bridge
  - City of St. Martinville
  - City of New Iberia
  - City of Jeanerette
  - Town of Delcambre
  - Village of Loreauville
  - City of Morgan City
  - City of Franklin
  - City of Patterson
  - Town of Baldwin
  - Town of Berwick
  - Tribal Nation of the Chitimacha
7. Past, current, or future interests or involvements (financial or otherwise) by you, your spouse, or your children related to Atchafalaya Basin.
8. Current personal involvement with other USACE projects, including whether involvement was to author any manuals or guidance documents for USACE. If yes, provide titles of documents or description of project, dates, and location (USACE district, division, Headquarters, Engineer Research and Development Center [ERDC], etc.), and position/role. Please highlight and discuss in greater detail any projects that are specifically with the New Orleans District.
9. Previous or current involvement with the development or testing of models that were used for, or in support of, the South Central Coast FS project.

Note – the models used in the South Central Coast FS are: Institute for Water Resources (IWR) Planning Suite II, Wetland Value Assessment (WVA), Hydrologic Engineering Center's (HEC) Flood Damage Reduction Analysis (FDA 1.4.2), HEC Flood Impact Analysis (FIA 2.2), HEC-LifeSim 1.0.1: A Model for Flood Life-Loss Estimation, Micro-Computer Aided Cost Estimating

## Panel Conflict of Interest (COI) Screening Questionnaire for the IEPR of the South Central Coast, Louisiana, Feasibility Study

System (MCACES MII Version 3.0), Delft3D Flow 4.02.03, HEC River Analysis System (RAS-1 and 2D), and AdCIRC SL15.

10. Current firm involvement with other USACE projects, specifically those projects/contracts that are with the New Orleans District. If yes, provide title/description, dates, and location (USACE district, division, Headquarters, ERDC, etc.), and position/role. Please also clearly delineate the percentage of work you personally are currently conducting for the New Orleans District. Please explain.
11. Any previous employment by USACE as a direct employee, notably if employment was with the New Orleans District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
12. Any previous employment by USACE as a contractor (either as an individual or through your firm) within the last 10 years, notably if those projects/contracts are with the New Orleans District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
13. Previous experience conducting technical peer reviews. If yes, please highlight and discuss any technical reviews concerning flood management, and include the client/agency and duration of review (approximate dates).
14. Pending, current, or future financial interests in contracts/awards from USACE related to the South Central Coast FS project.
15. Significant portion of your personal or office's revenues within the last three years came from USACE contracts.
16. Significant portion of your personal or office's revenues within the last three years came from Coastal Protection and Restoration Authority Board of Louisiana contracts.
17. Any publicly documented statement (including, for example, advocating for or discouraging against) related to the South Central Coast FS project.
18. Participation in relevant prior and/or current Federal studies related to the South Central Coast FS project.
19. Previous and/or current participation in prior non-Federal studies related to the South Central Coast FS project.
20. Has your research or analysis been evaluated as part of the South Central Coast FS project?
21. Is there any past, present, or future activity, relationship, or interest (financial or otherwise) that could make it appear that you would be unable to provide unbiased services on this project? If so, please describe.

Providing a positive response to a COI screening question did not automatically preclude a candidate from serving on the Panel. For example, participation in previous USACE technical peer review committees and other technical review panel experience was included as a COI screening question. A positive response to this question could be considered a benefit.

## B.2 Panel Selection

In selecting the final members of the Panel, Battelle chose experts who best fit the expertise areas and had no COIs. Table B-1 provides information on each panel member’s affiliation, location, education, and overall years of experience. Battelle established subcontracts with the panel members when they indicated their willingness to participate and confirmed the absence of COIs through a signed COI form. USACE was given the list of candidate panel members, but Battelle selected the final Panel.

**Table B-1. South Central Coast FS IEPR Panel: Summary of Panel Members**

Name	Affiliation	Location	Education	P.E.	Exp. (yrs)
<b>Planning Formulator/Economist</b>					
Don Ator	Independent Consultant	Baton Rouge, LA	M.S., Economics and Agriculture Economics; M.B.A., Concentration in Finance and Accounting	N/A	40+
<b>Environmental Law Compliance/Cultural Resources Specialist</b>					
Joanna Morsicato	Independent Consultant	Morrison, CO	B.A., Anthropology; M.A., Geography	N/A	42
<b>H&amp;H Engineer</b>					
Peter Baril	GZA GeoEnvironmental, Inc.	Norwood, MA	M.S., Hydrology	Yes	39
<b>Civil Engineer</b>					
Scott Arends	Hanson Professional Services, Inc.	Springfield, IL	B.S., Civil Engineering; B.S, Physics	Yes	23
<b>Geotechnical Engineer</b>					
Charles Aubeny	Independent Consultant	Bryan, TX	Ph.D., Civil Engineering	Yes	35

Table B-2 presents an overview of the credentials of the final five members of the Panel and their qualifications in relation to the technical evaluation criteria. More detailed biographical information on the panel members and their areas of technical expertise is given in Section B.3.

**Table B-2. South Central Coast FS IEPR Panel: Technical Criteria and Areas of Expertise**

Technical Criterion	Ator	Morsicato	Baril	Arends	Aubeny
<b>Planning Formulator / Economist</b>					
Minimum of 15 years of demonstrated experience in economics and planning					
M.S. or higher in economics	X				
An expert in the USACE plan formulation process, procedures, and standards	X				
Experienced in the evaluation of alternative plans for flood risk management	X				
Extensive knowledge of cost/benefit analysis for flood risk management	X				
	X				
<b>Environmental Law Compliance/Cultural Resources Specialist</b>					
		X			
		X			
<b>H&amp;H Engineer</b>					
Registered Professional Engineer					
A minimum of 15 years of experience in H&H engineering			X		
			X		
Knowledgeable of southwest riverine hydrology			X		
Proficient with the HEC River Analysis System (HEC-RAS) model			X		

**Table B-2. South Central Coast FS IEPR Panel: Technical Criteria and Areas of Expertise (continued).**

Technical Criterion	Ator	Morsicato	Baril	Arends	Aubeny
<b>Civil Engineer</b>					
Registered Professional Engineer					
A minimum of 15 years of experience in civil engineering and design				X	
B.S. or higher in engineering				X	
Experienced in designing channel modifications, levee systems, earthwork, structural diversion on arid regions' riverine systems				X	
Working knowledge of construction				X	
Capable of making professional determinations based on experience				X	
<b>Geotechnical Engineer</b>					
Registered Professional Engineer or Geologist					X
A minimum of 10 years of experience in geotechnical engineering					X
M.S. degree or higher					X
					X
Familiarity with design to account for ground fissures due to causes such as subsurface water withdrawal is strongly encouraged					X

### B.3 Panel Member Qualifications

Detailed biographical information on each panel members' credentials, qualifications, and areas of technical expertise are summarized in the following paragraphs.

<b>Name</b>	<b>Don Ator</b>
<b>Role</b>	<b>Planning Formulator/Economist</b>
<b>Affiliation</b>	<b>Independent Consultant</b>

Mr. Ator is an independent consultant and serves as Research Associate, Professor, and Undergraduate Advisor in the Department of Agriculture Economics and Agribusiness at Louisiana State University. He earned his M.S. in economics and agriculture economics and his M.B.A. with a concentration in finance and accounting from Louisiana State University. His current research is in financial resiliency analysis and planning for local governments in Louisiana, Texas, Alabama, Mississippi, Florida, Georgia, Kentucky, and Nebraska.

Mr. Ator has 40 years of experience working for 28 USACE districts, first as a full-time employee with the Vicksburg District, then with a not-for-profit research institute, and later at three architect-engineer firms. He has demonstrated experience in flood risk management evaluating and conducting complex multi-objective public works projects with high public and interagency interest. A few examples of the more than 500 flood risk management projects Mr. Ator has conducted include Sensitivity Analysis of Benefit and Cost Evaluation Criteria to Risk and Uncertainty Associated with Study Parameters, Flood Damage Reduction Feasibility Study, Passaic River Basin, New York and New Jersey, USACE New York District; Rancho Palos Verdes, Rolling Hills Shoreline Erosion and Storm Damage Reduction Reconnaissance Study, Los Angeles, California, USACE Los Angeles District; Reconnaissance Study and Report for Flood Damage Prevention, St. Croix, U.S. Virgin Islands, USACE Jacksonville District; Reconnaissance Study and Report for Flood Damage Prevention, Sandusky River Basin, Ohio, USACE Buffalo District; Section 905(b) Flood Damage Reduction Reconnaissance Report, Lower Sabine River, Texas and Louisiana, USACE Galveston District; Section 205 Flood Damage Reduction Study, High School Branch, Newton County, Missouri, USACE Little Rock District; and Flood Damage Reduction Feasibility Study, Sweetwater Creek, Austell and Lithia Springs, Georgia, USACE Mobile District.

Mr. Ator has worked extensively with USACE conducting flood risk management analysis, performing economic calculations using the Hydrologic Engineering Center (HEC) Flood Damage Reduction Analysis software (HEC-FDA 1.4.2). He has expertise in methodologies for estimating life loss via the use of HEC's LifeSim software (HEC-LifeSim 1.0) and/or Flood Impact Analysis software (HEC-FIA 3.0).

Mr. Ator has extensive experience directly dealing with the USACE six-step planning process governed by Engineer Regulation (ER) 1105-2-100, Planning Guidance Notebook. He developed and field tested a template for preparing project management plans for feasibility studies for USACE Regional Planning and Environment Division South. He served as a team leader while embedded in the Plan Formulation Branch USACE New Orleans District, directing plan formulation activities of three plan formulators and providing project oversight and review to ensure compliance with USACE guidelines.

Mr. Ator is actively involved in professional engineering and scientific societies, including the Society of American Military Engineers (SAME) and the American Society of Civil Engineers (ASCE).

<b>Name</b>	<b>Joanna Morsicato</b>
<b>Role</b>	<b>Environmental Law Compliance/Cultural Resources Specialist</b>
<b>Affiliation</b>	<b>Independent Consultant</b>

Ms. Morsicato has 42 years of experience working on environmental protection programs using applicable laws, regulations, and practices associated with the National Environmental Policy Act (NEPA), Clean Air Act (CAA), Clean Water Act (CWA), Fish and Wildlife Coordination Act (FWCA), Endangered Species Act (ESA), and National Historic Preservation Act (NHPA) for public infrastructure and private projects. Most recently, she was the environmental and planning lead at Michael Baker International until she retired in mid-2017. While at that firm, she taught a webinar on NEPA compliance (and associated acts) for the water resources group company-wide, with close to 100 participants in February 2017. Ms. Morsicato earned a master’s degree in geography and urban planning from the University of Colorado in 1976. She has also completed numerous additional courses to support her NEPA and environmental compliance expertise.

Ms. Morsicato is familiar with the habitat, fish and wildlife species, and tribal cultures and archeology that may be affected by the project alternatives in the study area and has a solid understanding of the principles of flood protection. She has a general background in fish and wildlife habitat and species, tribal cultures, and archaeology found in the Gulf Coast states. Most of her large project work has been in urban areas (Honolulu and Denver); however, in the course of her career, Ms. Morsicato has worked on, provided quality assurance (QA) reviews, and/or supervised staff for various projects across the United States. An example of a recent detailed QA review involved an environmental assessment (EA) for a Federal Aviation Administration project at the Tallahassee International Airport (Florida) for a solar farm.

In her capacity as an environmental compliance manager for various large engineering firms, Ms. Morsicato has often reviewed projects for conformity with NEPA, CWA, ESA, NHPA, and other applicable regulations.

Ms. Morsicato is familiar with large complex Civil Works projects with high public and interagency interests. A recent example is her role as the Deputy Manager of Planning and Environment for the Honolulu, Hawai’i, Authority for Rapid Transportation (HART). In that capacity, she worked on the final design and construction phase of the Honolulu Rail Transit Project (H RTP), a \$5.2-billion plus, 20-mile, elevated steel wheel-on-steel rail transit system with 21 transit stations, from 2011 through 2014. She also participated in various Section 404 permitting activities for H RTP waterway crossings with the USACE Honolulu District and performed U.S. Fish and Wildlife (USFWS) ESA Section 7 coordination for the project. In addition, she wrote the project’s Hawai’i Coastal Zone Management Program Consistency Assessment for the agency. She provided management and oversight of the NHPA Section 106 Programmatic Agreement (PA) implementation and served as Archaeological Inventory Survey Manager for HART.

Ms. Morsicato has extensive expertise in consistency reviews and environmental compliance for large and small projects, including the preparation of corridor studies, baseline surveys, categorical exclusions (CEs), EAs, EISs, cultural resource assessments, and Section 106 PAs. She was involved with NEPA activities associated with the Beech Ridge Wind Energy EIS for the USFWS in Greenbrier and Nicholas counties, West Virginia, and she worked on an EA and a Finding of No Significant Impact for the Denver Regional Transportation District environmental evaluations for extension of the Southeast and Southwest

Light Rail Corridors and Colorado Department of Transportation (CDOT) projects. Examples of smaller projects in the state of Colorado include overseeing biological assessments for various roadway improvements between Cañon City and Colorado Springs for CDOT; overseeing wetlands impacts for bridge replacement for a county road in Rio Blanco County; obtaining approvals from the Bureau of Land Management for groundwater wells in Garfield County; and performing CE work for a bypass for the Town of Delta.

Over her 42-year career, Ms. Morsicato's projects have typically included elements of compliance and coordination with the CWA (including USACE) and ESA as well as consultation (informal and formal) with USFWS. She is familiar with the USFWS Habitat Evaluation Procedures. Ms. Morsicato has recent experience with QA and IEPR reviews for USACE projects, including the Portland District (2014, Mount St. Helens Sediment Retention Structure project) as well as the Honolulu District (2016, Ala Wai Canal IEPR) and the Albuquerque District (2018, Middle Rio Grande Flood Protection Project).

<b>Name</b>	<b>Peter Baril, P.E.</b>
<b>Role</b>	<b>H&amp;H Engineer</b>
<b>Affiliation</b>	<b>GZA GeoEnvironmental, Inc</b>

Mr. Baril is a Senior Hydrologic Engineer specializing in hydrology and in flood control analysis and design. Since 1998, he served at a Principal-in-Charge capacity and led the Water Resources Team for GZA's Norwood, Massachusetts, office. Much of his work has included dam safety and flood control investigatory studies and remedial design repair projects, as well as other water resource engineering-related assignments. After 30 years with GZA, Mr. Baril retired in June 2019. Mr. Baril is currently an active, part-time consultant for GZA.

Mr. Baril is a registered professional engineer in Massachusetts, Maine, Connecticut, and New Hampshire. He has 39 years of experience in the fields of dam and water resources engineering and specializes in urban hydrology, flood control analysis and design, and surface water hydrology and open-channel hydraulics. Over the course of his career, Mr. Baril has employed both deterministic and probabilistic statistical hydrologic methods to develop annual exceedance probability characteristics and apply them to the design of hydraulic structures. He has applied these statistical methods in risk-based decision-making protocols for water resource projects. Mr. Baril has developed a detailed working knowledge of USACE's tolerable risk guidelines and risk management protocols as outlined in USACE's ER 1110-2-1156, Safety of Dams – Policy and Procedures. A number of his dam safety projects include applying USACE and Bureau of Reclamation concepts dealing with identification of failure modes during initial phases of dam assessment and development of design concepts for repairs, with the primary focus being on spillway capacity, overtopping potential, and outlet control facilities.

Over the past several years, Mr. Baril has applied his experience in dam safety/flood control engineering as a subject matter expert/peer reviewer on a number of major dam rehabilitation projects for the New York City (NYC) Department of Environmental Protection (DEP). He has also served on two IEPR Panels, commissioned by Battelle, for USACE flood control projects in California.

In his nearly 40 years of consulting engineering experience, Mr. Baril has utilized water surface profile modeling software, primarily 1D and 2D versions of HEC-RAS and predecessor program HEC-2. He has used this software package for dam breach propagation and sediment transport studies and is well-versed in the Federal Highway Administration's HEC-18 bridge scour methods. More recently, Mr. Baril

has provided peer review of “rain-on-grid,” a two-dimensional HEC-RAS hydraulic modeling method employed by USACE to estimate runoff from various extreme events up to the Probable Maximum Flood (PMF).

Much of Mr. Baril’s project experience has been focused in the areas of dam safety inspections, emergency action planning, and design/improvement of spillways and related hydraulic structures. He has made presentations to various regulators associated with project permitting at the local, state, and Federal levels and has provided expert witness testimony and value engineering consulting on water resource related projects. He is familiar with, and has participated, as a subject matter expert, in technical review sessions for dam repair-related projects for the NYC Office of Management and Budget/DEP site visits (Gilboa and New Croton Dams) and workshops, with primary focus on augmenting spillway capacity to safely pass design floods. Mr. Baril is well-versed in his area of expertise and can coordinate, interpret, and explain testing results with other engineering disciplines about H&H analyses.

In 2012, Mr. Baril was a member of the IEPR Panel for Lake Isabella Dam, California, which reviewed the geotechnical, hydrological, hydraulic, structural, and economic aspects of the Dam Safety Modification Report. Mr. Baril worked as a subcontractor to Battelle for this assignment. The IEPR team evaluated the proposed \$500 million design repairs at this critical flood control dam near Bakersfield, California. His role was to review and comment on the USACE’s Final Hydrology Report, Spillway Adequacy Study, and associated baseline risk assessment report. Many of his efforts focused on the risk-informed decision-making methods employed for evaluating hydrologic loading probability characteristics, probabilities of overtopping potential failure mode, population at risk, and loss of life consequences.

More recently (2018-2019), Mr. Baril was a member of a five-person, subject matter IEPR Panel hired by Battelle to conduct a detailed engineering peer review for a major USACE Civil Works project located in the San Gabriel Valley, east of Los Angeles. Whittier Narrows is a major flood control reservoir originally completed in 1957. The dam embankment is of earthen construction, 90 feet high and about 4.5 miles long. Several safety issues had been identified at the dam as part of USACE’s Dam Safety Modification Study (DSMS). Mr. Baril’s responsibility was to evaluate the H&H aspects of the DSMS, including design basis computations such as “rain-on-grid,” HEC-RAS-modeled PMF analysis, and proposed mitigation measures to bring the annual probability of failure and associated consequences to below tolerable risk guidelines. The project tasks included a meeting with USACE design engineers, a site reconnaissance of the dam and appurtenant structures, and preparation of Final Panel Comments and a Final IEPR Report.

Recently, Mr. Baril was part of a three-member subject matter expert team reviewing the design work performed by the Joint Venture Design Team dealing with development of spillway design criteria for the spillway structures associated with Ashokan Reservoir/Olive Bridge Dam, located in the Catskill Region of New York State. Ashokan is a key water supply reservoir owned and operated by the NYC DEP. Mr. Baril reviewed and commented on design documents and attended periodic workshops hosted by NYC DEP and the Joint Venture Design Team associated with meteorological methods and results dealing with the development of the site-specific Probable Maximum Precipitation as well as H&H methods associated with the estimation of the PMF and overtopping potential of the main dam embankment and dikes.

<b>Name</b>	<b>Scott Arends, P.E., CFM</b>
<b>Role</b>	<b>Civil Engineer</b>
<b>Affiliation</b>	<b>Hanson Professional Services, Inc.</b>

Mr. Arends is a Civil Works project manager for dam safety and flood risk management projects and a senior H&H engineer with Hanson Professional Services, Inc. He has 23 years of experience in civil engineering, 12 of which are with his current company. Mr. Arends received a B.S. in civil engineering (emphasis geotechnical) from the University of Illinois at Urbana-Champaign in 1996 and a B.S. in physics from Western Illinois University in 1997. He is a P.E. in Arkansas, Illinois, Indiana, Louisiana, New Jersey, North Dakota, Iowa, Ohio, and New York. He is also a Certified Floodplain Manager in Illinois.

Mr. Arends has led the H&H analysis, peer review, forensic failure analysis, and design, plans, and specifications for numerous dams and complex water resource projects throughout the country. For the USACE Memphis District, Mr. Arends was the Civil Works, geotechnical, and H&H reviewer for an IEPR/Safety Assurance Review (SAR) of the St. Francis Levee Renovation in Clay County, Alaska. The project included renovation of approximately 6,300 feet of levee embankment with seven through-levee culverts on the West Bank. The St. Francis Floodway Levee System included four tasks: re-establishing the levee centerline; restoring the net levee section with 1V:3H slopes and 15-foot vegetation-free zones; eliminating four redundant culverts; and replacing seven gated culverts. Mr. Arends completed IEPR reviews on both the design and construction phases of the flood risk management system. He has also conducted peer reviews of the following projects for USACE: 1) Canton Dam Auxiliary Spillway Channel, Canton, Oklahoma (Tulsa District), 2) Pine Creek Dam, McCurtain County, Oklahoma (Tulsa District), and 3) Center Hill Dam, near Nashville, Tennessee (Nashville District).

Mr. Arends has extensive experience with USACE’s Adaptive Hydraulics (AdH) (2D), HEC-RAS, and HEC-HMS models and their integration with geographic information systems (GISs) to develop H&H models and inundation/flood hazard mapping. For the USACE St. Paul District, Mr. Arends was a senior hydraulic engineer leading a team of 2D modelers in the evaluation of performance metrics, optimization of the geometric configuration, and development of design criteria, for an aqueduct structure carrying the Maple River over the diversion channel for the Red River around Fargo, North Dakota. Prior to joining Hanson, he served 10 years as a dam safety and floodplain construction regulatory engineer with the Illinois Department of Natural Resources, administering the department’s dam safety, public waters, and floodplain development regulations. He conducted dam inspections, issued permits, and peer reviewed hundreds of H&H analyses.

Mr. Arends is currently leading the development of a 3.5-mile-long, \$220 million flood risk management system to meet the Federal Emergency Management Agency’s (FEMA) National Flood Insurance Program accreditation for a 500-year design flood and support public waterfront access for the Cedar Rapids West Side Flood Control System, Cedar Rapids, Iowa. He facilitated a project kick-off charrette with both east and west teams to establish communication protocols, design criteria, survey and computer-aided design and drafting standards, and peer review procedures that meet USACE Engineer Manual (EM) and Engineer Technical Letter (ETL) criteria. As project manager, Mr. Arends is leading a multi-discipline team of engineers in geotechnical analysis and foundation design criteria for the entire West alignment, structural design of all floodwalls and closure structures, as well as comprehensive design, plans, specifications, design documentation reports (DDRs), potential failure modes analysis, permitting, and construction-phase services for all floodwall and flood-closure gate segments. He also led

updates to the 25-mile Cedar River HEC-RAS model and the development of the Hydraulic DDR Appendix for use by both the east and west teams. Completed design segments include 1) 850 feet of pile-supported T-type floodwall, trails, pump station footprint, and a 45-foot roller gate monolith; 2) 350 feet of drilled shaft-supported T-type floodwall with an integral restroom/wet floodproofed storage building; 3) conceptual (30%) design of 1,460 feet of floodwall through an interstate highway ramp and under the bridge; 4) 90% design of a roller gate monolith, appurtenant T-wall, and I-wall transition to levee; 5) conceptual (30%) design of 1,050 feet of partially demountable floodwall; and 6) subsurface investigations and geotechnical design for 6 pump stations, 14 gatewells, and 2,200 feet of levee, including slope stability, settlement, and seepage analyses to inform design recommendations at a site challenged by up to 10 feet of highly variable fill over sand. Mr. Arends regularly collaborates with the USACE Rock Island District Design Team working on the East Side Flood Control System to facilitate design continuity, overtopping resiliency, and constructability considerations.

For the Illinois Department of Natural Resources Stratton Lock and Dam Lock Capacity and Water Level Control Improvements, McHenry County, Illinois, project, Mr. Arends was the lead dam safety and hydraulic engineer working to expand the lock structure and relocate the spillway, replacing the capacity of five existing sluice gates with three 28-foot-long hinged crest gates, at Stratton Lock and Dam. He led the hydraulic optimization of the approach apron, pier configuration, gate operations, stilling basin geometry, cofferdams, and construction sequencing to address resiliency objectives and meet zero-rise permit criteria.

Mr. Arends is a member of SAME and the Association of State Dam Safety Officials (ASDSO) Advisory Committee, as well as a technical advisor to the ASDSO Dam Failures Investigation Committee. Mr. Arends participated in the Maple River Aqueduct Value Based Design Charrette, recognized by both SAVE International's 2013 award for Outstanding Value Management in Government to the St. Paul District, and the Department of Defense's 2012 Value Engineering Achievement Award to USACE.

<b>Name</b>	<b>Charles Aubeny, Ph.D., P.E.</b>
<b>Role</b>	<b>Geotechnical Engineer</b>
<b>Affiliation</b>	<b>Independent Consultant</b>

Dr. Aubeny is a professor at Texas A&M University teaching soil mechanics, geotechnical design, geotechnical testing, and numerical methods in geotechnical engineering. He earned his Ph.D. in civil engineering from the Massachusetts Institute of Technology in 1992 and is a registered P.E. in Colorado, Texas, and California. His experience includes over 19 years of academic research and external consulting involving slope stability, in situ testing, numerical analysis, foundations and pipelines, and unsaturated soils; 8 years with the Embankment Dams Branch of the U.S. Bureau of Reclamation (USBR); and 7 years in private consulting. His geotechnical engineering experience relevant to levee and earth dam design and construction includes supervising geotechnical field investigations and laboratory testing programs; supervising and/or performing analyses for seepage, static and dynamic slope stability, static settlement, liquefaction, seismically induced settlements, and wave run-up; developing and evaluating various foundation remediation alternatives; designing earthen embankments, including the internal filter and drainage systems; designing slope protection measures; designing instrumentation systems for monitoring; supervising cost comparisons for various design alternatives; preparing specifications; preparing construction considerations and monitoring construction; developing guidelines for reservoir first filling and dam operation, and evaluating the safety of existing dams and levees and

preparing upgrade alternatives to address deficiencies. His expertise includes performing cost engineering and construction management for all phases of flood risk management, including levee engineering experience (1992-1999) that included comparative cost evaluations and quantity/cost estimates on dam design and remediation alternatives in embankment dam design at USBR (1978-1986).

Dr. Aubeny's experience includes the following projects: director of geotechnical investigations for the Elk Grove Bufferlands Mitigation for the California Department of Water Resources; director of site investigations, geotechnical analyses, geotechnical quality control and instrument monitoring for the Mokelumne Aqueduct Upgrade for the East Bay Municipal Utility District; resident engineer for the Butt Valley Dam seismic upgrade and stream channel restoration for Pacific Gas & Electric; director of site investigations and geotechnical analyses for upgrades to the North Beach Lake and the regional wastewater treatment plant flood control system for the Sacramento Area Flood Control Agency involving both earthen embankments and concrete floodwalls; the Twitchell Island, Sherman Island, and Hotchkiss Tract levees for individual reclamation districts in coordination with the California Department of Water Resources; and wastewater retention dikes for Sonoma County. At the USBR, he served as design engineer involved in all phases of the McGee Creek Dam project in southeast Oklahoma, including geotechnical site characterization; evaluation of earthen and rockfill embankment alternatives; final design addressing issues of slope stability, through- and under-seepage, dispersive erosion, settlement, riprap slope protection, freeboard, and appurtenant structures such as outlet conduits; and monitoring of construction to provide design approval for adequacy of the foundation excavation and surface treatment, the grout curtain, and the earthfill placement. His USBR experience also includes safety evaluations of existing dams throughout 17 Western states. He drafted the USBR Design Standards for Foundation Surface Treatment for Embankment Dams, which were in effect from 1986 until they were incorporated into an updated version in 2012.

Dr. Aubeny has performed IEPs for the Freeport Harbor Navigation Improvement Project (2008), the Mississippi Coastal Improvement Study (2008-2009), the Santa Maria and Bradley Canyon, California, levees (2010-2012), the Kansas Citys, Missouri and Kansas, Flood Risk Management Project (2012-2014), the Dallas Floodway Feasibility Study and Environmental Impact Statement (2013), the Lower San Joaquin River, California, Flood Risk Management Feasibility Study (2015-2017), and the City of Norfolk, Virginia, Coastal Storm Risk Management Feasibility Study (2017-2018). Collectively, these reviews addressed topics of risk assessment; adequacy of geotechnical site investigations; slope stability analysis; seepage analysis; riprap and soil cement slope protection; seepage barriers such as slurry trenches and sheetpile walls; drainage measures, including relief wells; regional impacts of seepage control measures; floodwall stability; pile supports for floodwalls; closure structures; encroachments to embankments; internal erosion; wave runup; overtopping; soil improvement; constructability; and construction quality control. He is capable of addressing the USACE SAR aspect of projects and has served on the USACE SAR panel for the Santa Maria Levee slope protection upgrade.

Dr. Aubeny's design experience with problems involving ground fissures due to subsidence includes his work in the Sacramento-San Joaquin Delta, where significant subsidence is occurring due to oxidation and erosion of organic soils, accompanied by progressive lowering of water levels by pumping to keep pace with subsiding ground levels. Mitigation measures depended on project-specific features, but included direct excavation and refilling/recompacting of fissure zones, grouting of fissures, and use of seepage barriers (slurry trenches, geomembranes, and sheetpiles) to intercept seepage paths created by fissures, berms to stabilize ground movements, and pile supports for structures and pipelines affected by the fissures.

Dr. Aubeny has practical experience with commercial software supporting geotechnical analysis and design for slope stability, seepage, deformation and settlement, pile installation, axial and lateral pile response, and seismic response. He also teaches two graduate courses in numerical methods covering both theoretical development and practical applications for these types of programs. He actively participates in related professional engineering activities and has published more than 80 professional papers. He is a Fellow in the ASCE and serves as Associate Editor for two prominent journals: the ASCE Journal of Geotechnical and Geoenvironmental Engineering and the American Society for Testing and Materials Journal of Geotechnical Testing.

# APPENDIX C

Final Charge for the South Central Coast FS IEPR

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## Charge Questions and Guidance to the Panel Members for the Independent External Peer Review (IEPR) of the South Central Coast, Louisiana, Feasibility Study

***This is the final Charge to the Panel for the South Central Coast FS IEPR. This final Charge was submitted to USACE as part of the final Work Plan, originally submitted on October 2, 2019. The dates and page counts in this document have not been updated to match actual changes made throughout the project.***

### BACKGROUND

The study area is comprised of ecosystems having national significance as demonstrated by the presence of Bayou Teche National Wildlife Refuge and the State of Louisiana Marsh Island Wildlife Refuge and the Attakapas and Atchafalaya Delta Wildlife Management Areas and the Federal authorizations and implementation of the USACE Mississippi River and Tributaries project, the USACE Atchafalaya Basin Floodway System, the multi-Federal agency Coastal Wetlands Planning, Protection and Restoration Act program, and by the USACE Louisiana Coastal Area program. The Atchafalaya Basin is unique because it has a growing delta system. Designated by Congress in 2006 as a National Heritage Area, the Atchafalaya Basin has significant cultural, historic, scenic and recreational resources. It is the Nation's largest alluvial bottomland and swamp, providing habitat for 24 Federal- and state-listed threatened or endangered species, or species of concern such as Louisiana black bear, brown pelicans, and bald eagles. About 22 million pounds of crawfish are commercially harvested annually from the basin.

Hurricanes riverine, rainfall, and tropical storms pose a significant risk to the communities, ecosystems, and industries of the Louisiana gulf coast. Approximately 177,000 people reside within the study area. The area has suffered from disasters and will continue to suffer from natural disasters without some form of CSRM solution. Repeated storm events including Hurricanes Andrew, Rita, Gustav, and Ike which made landfall affecting the entire study area, resulted in economic damages to structures and properties, wildlife and property, and repeated mandatory evacuation costs. Emergency declarations have been declared in 22 of the last 30 years, due to coastal storm or riverine flooding damages. This area is also vulnerable to coastal land loss and degradation reducing the natural resiliency of the area to storm surge and flood attenuation. From 1932 to 2010, the area experienced a net loss of approximately 22,500 acres of wetlands. The continuous wetlands losses impact migratory species, the ecological nurseries of the Gulf of Mexico, and various commercial and recreational activities.

The area includes many industries with national significance including the carbon black manufacturing plants of Cabot Corporation, Columbian Chemicals, and Degussa Engineered Carbons. These plants are among the largest carbon black producers in the U.S. The area is a hub for ship building and fabricating the oil and gas services and extraction industries vital to the U.S. economy. The Strategic Petroleum Reserve maintains storage facilities immediately north and west of the study area with transfer and processing infrastructure traversing the area. Numerous federal lands and water resources investment programs are active in the study area. Congress, in Section 906 (e) and (f) of the Water Resources Development Act of 1986, enacted legislation that designated fish and wildlife enhancement within the Lower Atchafalaya Basin Floodway as having national significance.

South Central Coast Louisiana Feasibility Study residents are currently at risk from coastal storms. The project area consists of approximately 75,263 structures above the ground surface valued at \$18.6 billion. Residential and non-residential structures are raised on average 1 to 2 feet. Current Federal projects are largely constructed on the eastern edge of the study area. The existing Atchafalaya Basin Floodway

System was authorized to address riverine flooding from the Atchafalaya River Basin and not designed to address coastal storm surge occurring from tropical storm events.

The study area suffers from the highest Relative Sea Level Rise in the country. Sea level rise at moderate- and high-level projections would result in loss of Marsh Island, further loss of barrier islands like Rabbit and Duck Key, and loss of marsh habitat in the project area. Loss of remaining barrier islands and marsh habitat would allow storm surge and damages to occur farther up into the human settlements within St. Martin, St. Mary and Iberia Parishes. Impacts of storm events could increase with the increasing relative sea level rise.

## OBJECTIVES

The objective of this work is to conduct an independent external peer review (IEPR) of the South Central Coast, Louisiana, Feasibility Study (hereinafter: South Central Coast FS IEPR) in accordance with the Department of the Army, U.S. Army Corps of Engineers (USACE), Water Resources Policies and Authorities' *Review Policy for Civil Works* (Engineer Circular [EC] 1165-2-217, dated February 20, 2018), and the Office of Management and Budget's (OMB's) *Final Information Quality Bulletin for Peer Review* (December 16, 2004). Peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community. Peer review typically evaluates the clarity of hypotheses, validity of the research design, quality of data collection procedures, robustness of the methods employed, appropriateness of the methods for the hypotheses being tested, extent to which the conclusions follow from the analysis, and strengths and limitations of the overall product.

The purpose of the IEPR is to “assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analyses, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in evaluation of economic or environmental impacts, and any biological opinions” (EC 1165-2-217; p. 39) for the decision documents. The IEPR will be limited to technical review and will not involve policy review. The IEPR will be conducted by subject matter experts (i.e., IEPR panel members) who meet the technical criteria and areas of expertise required for and relevant to the project.

The Panel will be “charged” with responding to specific technical questions as well as providing a broad technical evaluation of the overall project. Per EC 1165-2-217 (p.41), review panels should identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods. Review panels should be able to evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable. Reviews should focus on assumptions, data, methods, and models. The panel members may offer their opinions as to whether there are sufficient analyses upon which to base a recommendation.

## DOCUMENTS PROVIDED

The following is a list of documents, supporting information, and reference materials that will be provided for the review. The review assignments for the panel members may vary slightly according to discipline.

Review Documents	No. of Review Pages	Subject Matter Experts				
		Planning Formulator/ Economist	Environmental Law Compliance/ Cultural Resources Specialist	Hydrology and Hydraulic Engineer	Civil Engineer	Geotechnical Engineer
South Central Coast Feasibility Report	128	128	128	128	128	128
Economics	50	50				
Plan Formulation	100	100	100	100	100	100
Other Social Effects	9	9	9			
Public Review Comments <sup>b,c</sup>	200	200	200	200	200	200
<b>Supplemental Information</b>						
Risk Register	4	4	4	4	4	4

<sup>a</sup> Option 2 will be implemented if the total number of review pages exceeds 908 ± 20%.

<sup>b</sup> USACE will submit public comments to Battelle, which will in turn submit to the IEPR Panel.

<sup>c</sup> The public comment page count was not included in the overall review pages because those hours will be considered separately and Options 1 or 3 will be implemented if they increase.

### Documents for Reference

- Review Policy for Civil Works, (EC 1165-2-217, February 20, 2018)
- Office of Management and Budget’s Final Information Quality Bulletin for Peer Review (December 16, 2004)
- Foundations of SMART Planning
- Feasibility Study Milestones (PB 2018-01, September 30, 2018; PB 2018-01(S), June 20, 2019)
- SMART – Planning Overview
- Planning Modernization Fact Sheet
- USACE Climate Change Adaptation Plan (2015)
- ETL 1100-2-1 – Procedures to Evaluate SLR Change Impacts Responses Adaptation
- ER 1100-2-8162 – Incorporating SLR Change in CW Programs.

### SCHEDULE & DELIVERABLES

This schedule is based on the receipt date of the final review documents and may be revised if review document availability changes. This schedule may also change due to circumstances out of Battelle’s

control such as changes to USACE’s project schedule and unforeseen changes to panel member and USACE availability. As part of each task, the panel member will prepare deliverables by the dates indicated in the table (or as directed by Battelle). All deliverables will be submitted in an electronic format compatible with MS Word (Office 2003).

Task	Action	Due Date
<b>Meetings</b>	Subcontractors complete mandatory Operations Security (OPSEC) training	11/16/2019
	Battelle sends review documents to panel members	11/26/2019
	Battelle convenes kick-off meeting with panel members	11/27/2019
	Battelle convenes kick-off meeting with USACE and panel members	12/2/2019
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	12/12/2019
<b>Review</b>	Panel members complete their individual reviews	12/31/2019
	Battelle provides talking points for Panel Review Teleconference to panel members	1/3/2020
	Battelle convenes Panel Review Teleconference	1/6/2020
	Battelle provides Final Panel Comment templates and instructions to panel members	1/7/2020
	Panel members provide draft Final Panel Comments to Battelle	1/13/2020
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	1/14/2020 – 1/21/2020
	Panel finalizes Final Panel Comments	1/22/2020
<b>Public Comment Review</b>	Battelle receives public comments from USACE	1/22/2020
	Battelle sends public comments to Panel	1/24/2020
	Panel completes its review of public comments	1/29/2020
	Battelle and Panel review the Panel's responses to the charge question regarding the public comments	1/30/2020
	Panel drafts Final Panel Comment for public comments, if necessary	2/3/2020
	Panel finalizes Final Panel Comment regarding public comments, if necessary	2/5/2020
<b>Final Report</b>	Battelle provides Final IEPR Report to panel members for review	2/7/2020
	Panel members provide comments on Final IEPR Report	2/11/2020
	*Battelle submits Final IEPR Report to USACE	2/13/2020
	USACE Planning Center of Expertise (PCX) provides decision on Final IEPR Report acceptance	2/21/2020

Task	Action	Due Date
<b>Comment Response Process</b>	Battelle inputs Final Panel Comments to Design Review and Checking System (DrChecks) and provides Final Panel Comment	2/25/2020
	Battelle convenes teleconference with Panel to review the Comment Response process	2/25/2020
	USACE Project Delivery Team (PDT) provides draft Evaluator Responses to USACE PCX for review	3/17/2020
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	3/23/2020
	USACE PCX provides draft PDT Evaluator Responses to Battelle	3/24/2020
	Battelle provides draft PDT Evaluator Responses to panel members	3/26/2020
	Panel members provide draft BackCheck Responses to Battelle	3/31/2020
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	4/1/2020
	Battelle convenes Comment Response Teleconference with panel members and USACE	4/2/2020
	USACE inputs final PDT Evaluator Responses to DrChecks	4/9/2020
	Battelle provides final PDT Evaluator Responses to panel members	4/10/2020
	Panel members provide final BackCheck Responses to Battelle	4/15/2020
	Battelle inputs panel members' final BackCheck Responses to DrChecks	4/16/2020
	*Battelle submits pdf printout of DrChecks project file	4/17/2020
<b>ADM</b>	Agency Decision Milestone (ADM) Meeting	3/27/2020
	Contract End/Delivery Date	10/30/2020

\* Deliverables

\*\* Battelle will provide public comments to panel members after they have completed their individual reviews of the project documents to ensure that the public comment review does not bias the Panel's review of the project documents.

## CHARGE FOR PEER REVIEW

Members of this IEPR Panel are asked to determine whether the technical approach and scientific rationale presented in the decision documents are credible and whether the conclusions are valid. The Panel is asked to determine whether the technical work is adequate, competently performed, and properly documented; satisfies established quality requirements; and yields scientifically credible conclusions. The Panel is being asked to provide feedback on the economic, engineering, environmental resources, and plan formulation. The panel members are not being asked whether they would have conducted the work in a similar manner.

Specific questions for the Panel (by report section or appendix) are included in the general charge guidance, which is provided below.

### General Charge Guidance

Please answer the scientific and technical questions listed below and conduct a broad overview of the decision documents. Please focus your review on the review materials assigned to your discipline/area of expertise and technical knowledge. Some sections have no questions associated with them; however, you may still comment on them. Please feel free to make any relevant and appropriate comment on any of the sections and appendices you were asked to review. In addition, please note that the Panel will be asked to provide an overall statement related to 2 and 3 below per USACE guidance (EC 1165-2-217).

1. Your response to the charge questions should not be limited to a “yes” or “no.” Please provide complete answers to fully explain your response.
2. Assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, and any biological opinions of the project study.
3. Assess the adequacy and acceptability of the economic analyses, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, and models used in evaluating economic or environmental impacts of the proposed project.
4. If appropriate, offer opinions as to whether there are sufficient analyses upon which to base a recommendation.
5. Identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods.
6. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable.
7. Please focus the review on assumptions, data, methods, and models.

Please **do not** make recommendations on whether a particular alternative should be implemented, or whether you would have conducted the work in a similar manner. Also, please **do not** comment on or make recommendations on policy issues and decision making. Comments should be provided based on your professional judgment, **not** the legality of the document.

1. If desired, panel members can contact one another. However, panel members **should not** contact anyone who is or was involved in the project, prepared the subject documents, or was part of the USACE Agency Technical Review (ATR).

2. Please contact the Battelle Project Manager/Program Manager Lynn McLeod; [mcleod@battelle.org](mailto:mcleod@battelle.org) for requests or additional information.
3. In case of media contact, notify the Battelle Program Manager, Lynn McLeod ([mcleod@battelle.org](mailto:mcleod@battelle.org)) immediately.
4. Your name will appear as one of the panel members in the peer review. Your comments will be included in the Final IEPR Report but will remain anonymous.

Please submit your comments in electronic form to the Project Manager, no later than 10 pm ET by the date listed in the schedule above.

## Independent External Peer Review of the South Central Coast, Louisiana, Feasibility Study

### Charge Questions and Relevant Sections as Supplied by USACE

The following Review Charge to Reviewers outlines the objectives of the Independent External Peer Review (IEPR) for the subject study and identifies specific items for consideration for the IEPR Panel.

The objective of the IEPR is to obtain an independent evaluation of whether the interpretations of analysis and conclusions based on analysis are reasonable for the subject study. The IEPR Panel is requested to offer a broad evaluation of the overall study decision document in addition to addressing the specific technical and scientific questions included in the Review Charge. The Panel has the flexibility to bring important issues to the attention of decision makers, including positive feedback or issues outside those specific areas outlined in the Review Charge. The Panel can use all available information to determine what scientific and technical issues related to the decision document may be important to raise to decision makers. This includes comments received from agencies and the public as part of the public review process.

The Panel review is to focus on scientific and technical matters, leaving policy determinations for USACE and the Army. The Panel should not make recommendations on whether a particular alternative should be implemented or present findings that become “directives” in that they call for modifications or additional studies or suggest new conclusions and recommendations. In such circumstances the Panel would have assumed the role of advisors as well as reviewers, thus introducing bias and potential conflict in their ability to provide objective review.

Panel review comments are to be structured to fully communicate the Panel’s intent by including the comment, why it is important, any potential consequences of failure to address, and suggestions on how to address the comment.

The Review Panel is asked to consider the following items as part of its review of the decision document and supporting materials.

#### Broad Evaluation Charge Questions

1. Is the need for and intent of the decision document clearly stated?
2. Does the decision document adequately address the stated need and intent relative to scientific and technical information?
3. Given the need for and intent of the decision document, assess the adequacy and acceptability of the project evaluation data used in the study analyses.
4. Given the need for and intent of the decision document, assess the adequacy and acceptability of the economic, environmental, social, and engineering assumptions that underlie the study analyses.
5. Given the need for and intent of the decision document, assess the adequacy and acceptability of the economic, environmental, social, and engineering methodologies, analyses, and projections.

6. Given the need for and intent of the decision document, assess the adequacy and acceptability of the models used in the evaluation of existing and future without-project conditions and of economic or environmental impacts of alternatives.
7. Given the need for and intent of the decision document, assess the adequacy and acceptability of the methods for integrating risk and uncertainty.
8. Given the need for and intent of the decision document, assess the adequacy and acceptability of the formulation of alternative plans and the range of alternative plans considered.
9. Given the need for and intent of the decision document, assess the adequacy and acceptability of the quality and quantity of the surveys, investigations, and engineering sufficient for conceptual design of alternative plans.
10. Given the need for and intent of the decision document, assess the adequacy and acceptability of the overall assessment of significant environmental impacts, social justice, and any biological analyses.
11. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable.
12. Assess the considered and tentatively selected alternatives from the perspective of systems, including systemic aspects being considered from a temporal perspective, including the potential effects of climate change.
13. For the tentatively selected plan, assess whether the models used to assess life safety hazards are appropriate.
14. For the tentatively selected plan, assess whether the assumptions made for the life safety hazards are appropriate.
15. For the tentatively selected plan, assess whether the quality and quantity of the surveys, investigations, and engineering are sufficient for a concept design considering the life safety hazards and to support the models and assumptions made for determining the hazards.
16. For the tentatively selected plan, assess whether the analysis adequately addresses the uncertainty and residual risk given the consequences associated with the potential for loss of life for this type of project.

## **Battelle Summary Charge Questions to the Panel Members<sup>1</sup>**

### **Summary Questions**

17. Please identify the most critical concerns (up to five) you have with the project and/or review documents. These concerns can be (but do not need to be) new ideas or issues that have not been raised previously.

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<sup>1</sup> Questions 17 through 19 are Battelle-supplied questions and should not be construed or considered part of the list of USACE-supplied questions. These questions were delineated in a separate appendix in the final Work Plan submitted to USACE.

18. Please provide positive feedback on the project and/or review documents.

**Public Comment Questions**

19. Do the public comments raise any additional discipline-specific technical concerns with regard to the overall report?

# APPENDIX D

## Conflict of Interest Form

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David Kaplan  
USACE, Institute for Water Resources  
September 5, 2019  
C-2

**Conflicts of Interest Questionnaire**  
**Independent External Peer Review**  
**South Central Coast, Louisiana, Flood Protection and  
Coastal Storm Risk Management Feasibility Study**

The purpose of this document is to help the U.S. Army Corps of Engineers identify potential organizational conflicts of interest on a task order basis as early in the acquisition process as possible. Complete the questionnaire with background information and fully disclose relevant potential conflicts of interest. Substantial details are not necessary; USACE will examine additional information if appropriate. Affirmative answers will not disqualify your firm from this or future procurements.

NAME OF FIRM: **Battelle Memorial Institute Corporate Operations**  
REPRESENTATIVE'S NAME: **Courtney Brooks**  
TELEPHONE: **614-424-5623**  
ADDRESS: **505 King Avenue, Columbus, Ohio 43201**  
EMAIL ADDRESS: **brooksc1@battelle.org**

I. INDEPENDENCE FROM WORK PRODUCT. Has your firm been involved in any aspect of the preparation of the subject study report and associated analyses (field studies, report writing, supporting research etc.) **No** Yes (if yes, briefly describe):

II. INTEREST IN STUDY AREA OR OUTCOME. Does your firm have any interests or holdings in the study area, or any stake in the outcome or recommendations of the study, or any affiliation with the local sponsor? **No** Yes (if yes, briefly describe):

III. REVIEWERS. Do you anticipate that all expert reviewers on this task order will be selected from outside your firm? **No** Yes (if no, briefly describe the difficulty in identifying outside reviewers):

IV. AFFILIATION WITH PARTIES THAT MAY BE INVOLVED WITH PROJECT IMPLEMENTATION. Do you anticipate that your firm will have any association with parties that may be involved with or benefit from future activities associated with this study, such as project construction? **No** Yes (if yes, briefly describe):

V. ADDITIONAL INFORMATION. Report relevant aspects of your firm's background or present circumstances not addressed above that might reasonably be construed by others as affecting your firm's judgment. Please include any information that may reasonably: impair your firm's objectivity; skew the competition in favor of your firm; or allow your firm unequal access to nonpublic information.

**No additional information to report.**

Courtney M. Brooks  
\_\_\_\_\_  
Courtney Brooks

September 5, 2019  
\_\_\_\_\_  
Date

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Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal

***BATTELLE***

**It can be done**