

Final Independent External Peer Review Report Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals

Prepared by
Battelle Memorial Institute

Prepared for
Department of the Army
U.S. Army Corps of Engineers
Water Management and Reallocation Studies Planning Center of Expertise
Baltimore District

Contract No. W912HQ-15-D-0001
Task Order: W912HQ19F0114

March 13, 2020

This page is intentionally left blank.

CONTRACT NO. W912HQ-15-D-0001
Task Order: W912HQ19F0114

Final Independent External Peer Review Report Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals

Prepared by

Battelle
505 King Avenue
Columbus, Ohio 43201

for

Department of the Army
U.S. Army Corps of Engineers
Water Management and Reallocation Studies
Planning Center of Expertise
Baltimore District

March 13, 2020

This page is intentionally left blank.

Final Independent External Peer Review Report Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals

Executive Summary

Project Background and Purpose

The overall study area is the Alabama-Coosa-Tallapoosa (ACT) River Basin. The ACT River Basin includes the Alabama, Coosa, and Tallapoosa rivers and all areas in the basin boundaries from the headwaters downstream to the mouth of the Alabama River, where it joins the Tombigbee River to form the Mobile River. The ACT River Basin at its confluence with the Tombigbee River has a drainage area of 22,739 square miles and covers portions of the states of Alabama, Georgia, and Tennessee.

The U.S. Army Corps of Engineers (USACE) operates five multi-purpose reservoir projects in the ACT River Basin and is responsible for channel maintenance for that portion of the Alabama River from Mile 0 to Claiborne Lock at Mile 72:

- Allatoona Dam and Lake, Georgia
- Carters Dam and Lake and Carters Reregulation Dam, Georgia (functions as a single system)
- Robert F. Henry Lock and Dam and R.E. “Bob” Woodruff Lake, Alabama
- Millers Ferry Lock and Dam and William “Bill” Dannelly Lake, Alabama
- Claiborne Lock and Dam and Lake, Alabama

The Alabama Power Company (APC) operates 11 reservoir projects in the ACT River Basin for the primary purpose of hydroelectric power (hydropower) generation, although these projects provide other public benefits as well. Per Public Law 83-436, USACE has operational oversight for flood risk management (i.e., flood control) and navigation purposes for four of the APC reservoir projects in the ACT River Basin: the Weiss, H. Neely Henry, and Logan Martin projects on the Coosa River, and the R.L. Harris project on the Tallapoosa River.

Operations at the five USACE reservoir projects and the four APC reservoir projects with flood risk management and navigation support provisions are guided by a USACE ACT River Basin Master Water Control Manual (WCM) and individual project WCMs. An update of the ACT River Basin Master WCM and individual project WCMs, supported by an environmental impact statement (EIS), was completed in May 2015. During the WCM update process, USACE deferred consideration of two specific requests pending completion of further detailed studies and analyses: (1) a January 2013 updated request (updated again in 2018) from the State of Georgia to reallocate additional reservoir storage in Allatoona Lake to municipal and industrial (M&I) water supply; and (2) an APC request for changes to flood operations at the APC Weiss and Logan Martin projects (including associated updates to the WCMs for those projects).

The purpose of the Allatoona-Coosa Reallocation (ACR) Study is to evaluate the 2018 water supply request from the State of Georgia seeking to reallocate water storage in Allatoona Lake; evaluate proposed revisions to flood operations at two APC projects: Weiss Lake (Reservoir) and the Logan Martin Lake (Reservoir) in the Coosa Basin; and update any WCMS, as necessary, as a result of changes in operations. The analysis has been captured in a Draft Feasibility Report and Integrated Supplemental Environmental Impact Statement (Draft FR/SEIS), which is defined as the Decision Document.

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 Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals (hereinafter: ACR Study 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: water resources planning, economics, environmental and National Environmental Policy Act (NEPA), and water resources engineering or hydrology. 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 four-person Panel from this list.

The Panel received electronic versions of the decision documents (3,106 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.

Battelle subsequently received a summary spreadsheet of public comments from USACE on the ACR Study 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 ACR Study review documents. After completing its review of the public comments, the Panel identified a couple of new issues and generated two Final Panel Comments that summarized the concerns. In the end, a total of 11 Final Panel Comments were identified and documented. Of these, one was identified as having medium significance, two have medium/low significance, and eight have low significance.

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 ACR Study review documents. 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, is concise, and provides excellent supporting documentation on most engineering, environmental, economic, and planning issues. The project’s background, goals, and alternatives development are clear and well-stated in the documents. The Panel identified a few places where the report should be clarified to ensure complete documentation of the project findings.

Engineering: The Panel noted that additional documentation was needed for the Hydrologic Engineering Center (HEC)-Reservoir System Simulation (ResSim) and the HEC-River Analysis System (RAS) model. Without this information, there is the potential for misinterpretation to occur. The Panel suggested that additional clarification of the model assumptions, scenarios, model implementation period, input, and output be documented, including how climate change was incorporated. The Panel also believes that information on the Dam Safety Action Classification (DSAC) for Weiss and Logan Martin should be included and discussed in the determination of life safety hazards based on the proposed changes.

Environmental: In general, the documentation on the project environment was found to be appropriate for this phase of the project. However, although minimization of impacts to protected species is stated as a project commitment, the Draft FR/SEIS does not document whether any species thresholds are known to exist within the project area and whether they would be exceeded due to the changes in system operations. Furthermore, specific impacts to aquatic species, including protected species, due to changes in available habitat after operational changes occur are not discussed. The Panel believes this additional information is necessary to meet all NEPA requirements.

Economics: The Panel discovered several errors in the hydropower analysis report and, when combined with a lack of information on the methodology used to conduct the hydropower analysis, believes it raises concerns about the accuracy of the calculated National Economic Development (NED) benefits. The Panel was also concerned that a risk assessment was not incorporated into the flood damage analysis and that the Draft FR/SEIS does not include sufficient information on the methodologies used to analyze flood damages and estimate the NED flood damage benefits. Correction of, and documentation on, these two issues will help the Panel understand whether the NED benefits have been correctly calculated.

Plan Formulation: The Panel believes USACE did an excellent job simulating the implementation of the proposed changes, the effects of those changes on water levels in the reservoirs, and the patterns of streamflow due to reservoir releases. However, there were a few areas where insufficient documentation was available to understand how decisions were made that led to various aspects of the Tentatively Selected Plan (TSP). For instance, the Panel noted that it is unclear how the recreation impact zones for Weiss and Logan Martin reservoirs were determined, raising questions about the magnitude of NED benefits for recreation under the TSP. Second, the Draft FR/SEIS does not document how, under the TSP, reductions in flood storage at Weiss and Logan Martin reservoirs would result in reductions in flood damages that meet the requirements of the Coosa Power Act. Last, modeling of the Future Without Project (FWOP) conditions does not take into account current deviations from the WCM for flood operations, which could result in flood damage reductions under the TSP being overestimated.

Table ES-1. Overview of 11 Final Panel Comments Identified by the ACR Study IEPR Panel

No.	Final Panel Comment
Significance – Medium	
1	A DSAC assessment, which is necessary to determine life safety hazards based on the proposed changes, was not completed for Weiss and Logan Martin.
Significance – Medium/Low	
2	Although minimization of impacts to protected species is stated as a project commitment, the Draft FR/SEIS does not document whether any species thresholds are known to exist within the project area and whether they would be exceeded due to the changes in system operations.
3	Specific impacts to aquatic species, including protected species, due to changes in available habitat after operational changes occur are not discussed.
Significance – Low	
4	Existing documentation on the HEC-RAS and HEC-ResSim model analyses for the entire river system is not sufficiently clear, resulting in potentially ambiguous perception of the model results and conclusions.
5	Errors in the hydropower analysis report, combined with a lack of information on the methodology used to conduct the hydropower analysis, raise concerns about the accuracy of the calculated NED benefits.
6	The flood damage analysis does not include a risk assessment, and the Draft FR/SEIS does not include sufficient information on the methodologies used to analyze flood damages and estimate the NED flood damage benefits.

Table ES-1. Overview of 11 Final Panel Comments Identified by the ACR Study IEPR Panel (continued)

No.	Final Panel Comment
7	It is unclear how the recreation impact zones for Weiss and Logan Martin reservoirs were determined, raising questions about the magnitude of NED benefits for recreation under the TSP.
8	The Draft FR/SEIS does not document how, under the TSP, reductions in flood storage at Weiss and Logan Martin reservoirs would result in reductions in flood damages that meet the requirements of the Coosa Power Act.
9	Modeling of the FWOP conditions does not take into account current deviations from the WCM for flood operations at Weiss and Logan-Martin, which could result in flood damage reductions under the TSP being overestimated.
10	The public noted inconsistencies in the mid-point year of construction and the inclusion of specific costs in the joint-use costs as presented in Appendix B, raising concerns about the estimated value of storage being considered for reallocation.
11	The environmental consequence classification terminology used on Table E-51 related to impacts is not clearly defined, resulting in potential misunderstanding of the significance of some impacts under the alternatives, including the TSP.

This page is intentionally left blank.

Table of Contents

	Page
Executive Summary	i
1. INTRODUCTION.....	1
2. PURPOSE OF THE IEPR.....	2
3. METHODS FOR CONDUCTING THE IEPR	2
4. RESULTS OF THE IEPR.....	3
4.1 Summary of Final Panel Comments	3
4.2 Final Panel Comments	4
5. REFERENCES.....	17
Appendix A. IEPR Process for the ACR Study Project	
Appendix B. Identification and Selection of IEPR Panel Members for the ACR Study Project	
Appendix C. Final Charge for the ACR Study IEPR	
Appendix D. Conflict of Interest Form	

List of Tables

	Page
Table ES-1. Overview of 11 Final Panel Comments Identified by the ACR Study IEPR Panel.....	iv

LIST OF ACRONYMS

ACF	Apalachicola-Chattahoochee-Flint
ACR	Allatoona-Coosa Reallocation
ACT	Alabama-Coosa-Tallapoosa
ADM	Agency Decision Milestone
APC	Alabama Power Company
BA	Biological Assessment
CE/ICE	Cost Effectiveness/Incremental Cost Analysis
CERP	Comprehensive Everglades Restoration Plan
COI	Conflict of Interest
DrChecks	Design Review and Checking System
DSAC	Dam Safety Action Classification
EC	Engineer Circular
EIS	Environmental Impact Statement
ER	Engineer Regulation
ERDC	Engineer Research and Development Center
ESA	Endangered Species Act
FIA	Flood Impact Analysis
FR/SEIS	Feasibility Report and Integrated Supplemental Environmental Impact Statement
FWOP	Future Without Project
H&H	Hydrology and Hydraulics
HEC	Hydrologic Engineering Center
IEPR	Independent External Peer Review
IWR	Institute for Water Resources
M&I	Municipal and Industrial
NED	National Economic Development
NEPA	National Environmental Policy Act
OEO	Outside Eligible Organization
OMB	Office of Management and Budget
PD&E	Project Development and Environment
PDT	Project Delivery Team

PIR/EIS	Project Implementation Report/Environmental Impact Statement
RAS	River Analysis System
ResSim	Reservoir System Simulation
SFWMD	South Florida Water Management District
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
TSP	Tentatively Selected Plan
WCM	Water Control Manual

This page is intentionally left blank.

1. INTRODUCTION

The overall study area is the Alabama-Coosa-Tallapoosa (ACT) River Basin. The ACT River Basin includes the Alabama, Coosa, and Tallapoosa rivers and all areas in the basin boundaries from the headwaters downstream to the mouth of the Alabama River, where it joins the Tombigbee River to form the Mobile River. The ACT River Basin at its confluence with the Tombigbee River has a drainage area of 22,739 square miles and covers portions of the states of Alabama, Georgia, and Tennessee.

The U.S. Army Corps of Engineers (USACE) operates five multi-purpose reservoir projects in the ACT River Basin and is responsible for channel maintenance for that portion of the Alabama River from Mile 0 to Claiborne Lock at Mile 72:

- Allatoona Dam and Lake, Georgia
- Carters Dam and Lake and Carters Reregulation Dam, Georgia (functions as a single system)
- Robert F. Henry Lock and Dam and R.E. “Bob” Woodruff Lake, Alabama
- Millers Ferry Lock and Dam and William “Bill” Dannelly Lake, Alabama
- Claiborne Lock and Dam and Lake, Alabama

The Alabama Power Company (APC) operates 11 reservoir projects in the ACT River Basin for the primary purpose of hydroelectric power (hydropower) generation, although these projects provide other public benefits as well. Per Public Law 83-436, USACE has operational oversight for flood risk management (i.e., flood control) and navigation purposes for four of the APC reservoir projects in the ACT River Basin: the Weiss, H. Neely Henry, and Logan Martin projects on the Coosa River, and the R.L. Harris project on the Tallapoosa River.

Operations at the five USACE reservoir projects and the four APC reservoir projects with flood risk management and navigation support provisions are guided by a USACE ACT River Basin Master Water Control Manual (WCM) and individual project WCMs. An update of the ACT River Basin Master WCM and individual project WCMs, supported by an Environmental Impact Statement (EIS), was completed in May 2015. During the WCM update process, USACE deferred consideration of two specific requests pending completion of further detailed studies and analyses: (1) a January 2013 updated request (updated again in 2018) from the State of Georgia to reallocate additional reservoir storage in Allatoona Lake to municipal and industrial (M&I) water supply; and (2) an APC request for changes to flood operations at the APC Weiss and Logan Martin projects (including associated updates to the WCMs for those projects).

The purpose of the Allatoona-Coosa Reallocation (ACR) Study is to evaluate the 2018 water supply request from the State of Georgia seeking to reallocate water storage in Allatoona Lake; evaluate proposed revisions to flood operations at two APC projects: Weiss Lake (Reservoir) and the Logan Martin Lake (Reservoir) in the Coosa Basin; and update any WCMs, as necessary, as a result of changes in operations. The analysis has been captured in a Draft Feasibility Report and Integrated Supplemental Environmental Impact Statement (Draft FR/SEIS), which is defined as the Decision Document.

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 Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals (hereinafter: ACR Study 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 ACR Study 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 ACR Study 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 ACR Study 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 four panel members to participate in the IEPR based on their expertise in the following disciplines: water resources planning, economics, environmental and National Environmental Policy Act (NEPA), and water resources engineering or hydrology. The Panel reviewed the ACR Study documents and produced 11 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 ACR Study IEPR review documents. The following summarizes the Panel's findings.

Based on the Panel's review, the report is well-written, concise, and provides excellent supporting documentation on most engineering, environmental, economic, and planning issues. The project's background, goals, and alternatives development are clear and well-stated in the documents. The Panel identified a few places where the report should be clarified to ensure complete documentation of the project findings.

Engineering: The Panel noted that additional documentation was needed for the Hydrologic Engineering Center (HEC)-Reservoir System Simulation (ResSim) and the HEC-River Analysis System (RAS) model. Without this information, there is the potential for misinterpretation to occur. The Panel suggested that additional clarification of the model assumptions, scenarios, model implementation period, input, and output be documented, including how climate change was incorporated. The Panel also believes that information on the Dam Safety Action Classification (DSAC) for Weiss and Logan Martin should be included and discussed in the determination of life safety hazards based on the proposed changes.

Environmental: In general, the documentation on the project environment was found to be appropriate for this phase of the project. However, although minimization of impacts to protected species is stated as a project commitment, the Draft FR/SEIS does not document whether any species thresholds are known to exist within the project area and whether they would be exceeded due to the changes in system operations. Furthermore, specific impacts to aquatic species, including protected species, due to changes in available habitat after operational changes occur are not discussed. The Panel believes this additional information is necessary to meet all NEPA requirements.

Economics: The Panel discovered several errors in the hydropower analysis report and, when combined with a lack of information on the methodology used to conduct the hydropower analysis, believes it raises concerns about the accuracy of the calculated National Economic Development (NED) benefits. The

Panel was also concerned that a risk assessment was not incorporated into the flood damage analysis and that the Draft FR/SEIS does not include sufficient information on the methodologies used to analyze flood damages and estimate the NED flood damage benefits. Correction of, and documentation on, these two issues will help the Panel understand whether the NED benefits have been correctly calculated.

Plan Formulation: The Panel believes USACE did an excellent job simulating the implementation of the proposed changes, the effects of those changes on water levels in the reservoirs, and the patterns of streamflow due to reservoir releases. However, there were a few areas where insufficient documentation was available to understand how decisions were made that led to various aspects of the Tentatively Selected Plan (TSP). For instance, the Panel noted that it is unclear how the recreation impact zones for Weiss and Logan Martin reservoirs were determined, raising questions about the magnitude of NED benefits for recreation under the TSP. Second, the Draft FR/SEIS does not document how, under the TSP, reductions in flood storage at Weiss and Logan Martin reservoirs would result in reductions in flood damages that meet the requirements of the Coosa Power Act. Last, modeling of the Future Without Project (FWOP) conditions does not take into account current deviations from the WCM for flood operations, which could result in flood damage reductions under the TSP being overestimated.

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

A DSAC assessment, which is necessary to determine life safety hazards based on the proposed changes, was not completed for Weiss and Logan Martin.

Basis for Comment

The life safety hazard analyses were completed by routing the Probable Maximum Flood from the WCM through the reservoir to evaluate the peak flow elevation, followed by a DSAC rating. The process to assess the safety hazards is adequate. The interpretations of analyses and conclusions are reasonably based on the modeling results and the associated assumptions, including the temporal perspective. However, the dam safety assessment was not completed for two of the three dams. A safety assessment for the Allatoona dam was completed, but the Weiss and Logan Martin dam assessments were not completed. The assumptions for the life safety hazards for Allatoona dam are appropriate as documented in Section 7.4 and Appendix C.

The models selected are adequate, but use of the models for assessment of the project at hand is not adequate. As documented in the Draft FR/SEIS, the APC is responsible for documenting dam safety as a part of the Federal Energy Regulatory Commission license; however, a brief summary of these assessments is essential for completion of this decision document.

Significance – Medium

The Draft FR/SEIS is incomplete without documentation of DSAC ratings for all three dams to explain life safety hazards.

Recommendation for Resolution

1. Provide a brief summary that focuses specifically on project and dam safety assessments for Weiss and Logan Martin dams.

Final Panel Comment 2

Although minimization of impacts to protected species is stated as a project commitment, the Draft FR/SEIS does not document whether any species thresholds are known to exist within the project area and whether they would be exceeded due to the changes in system operations.

Basis for Comment

Section 4.1.2.3 of the Draft FR/SEIS, Planning Constraints (lines 27-29), discusses that one of the planning constraints is considered to be the minimization of impacts to protected species, specifically five species of fish, ten species of freshwater mussels, and six species of snails. In order to address this constraint, a commitment is made to identify any thresholds that may be particularly important to these species during the impact analysis phase. Section E.1.6.4 of Appendix E reports that many are endemic to this river basin.

Protected species impact sections in the Draft FR/SEIS and Appendix E do not report on the presence or absence of any protected species 'thresholds', beyond which a species may be severely impacted. A threshold can be generally defined as a 'tipping point' beyond which there are impacts to a particular species, or an overall decrease in ecosystem services. The concept of the possible presence of a threshold recognizes the potential for non-linearity in species or ecosystem responses to system 'pressures' or changes. Thresholds are important when considering impacts to protected species, because their existence in these habitats is already at some level of risk.

Significance – Medium/Low

The presence or absence of thresholds is important to the overall understanding of the potential for impacts to these protected species, and their critical habitats, if any. The missing information will complete the impact assessment for protected species already at risk in these habitats.

Recommendations for Resolution

1. Complete the research, as needed, for determining if there are any known thresholds for the protected aquatic species within the basin.
2. Summarize the results within the appropriate impact sections in both the Draft FR/SEIS and Appendix E.

Final Panel Comment 3

Specific impacts to aquatic species, including protected species, due to changes in available habitat after operational changes occur are not discussed.

Basis for Comment

Aquatic species living within the streams (including endemic protected species) depend on availability of habitat. Broad statements are made about predicted impacts to habitat (and changes in depth zones within streams) but thorough analysis of this factor is missing or is not discussed.

Especially for those endemic protected species, discussion of potential impacts should include the potential for changes to quality and quantity of habitat (foraging habitat, breeding habitat needs, water quality) and forage for grazers and/or prey species.

Section 7.3.1.3 of the Draft FR/SEIS states that a Biological Assessment (BA) has been completed, and acknowledges that consultation with the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act is in progress and will be completed prior to the issuance of the Final FR/SEIS. The BA may contain more detailed information on habitat assessment but was not provided for review.

Significance – Medium/Low

Including additional detail with regard to habitat impacts will add clarity to the impact assessment results, particularly for endemic protected species whose existence in these habitats is already at risk.

Recommendations for Resolution

1. Complete quantitative and qualitative analysis of likely changes in the various types of habitats needed by endemic protected species.
2. Document the results in appropriate sections of the Draft FR/SEIS and Appendix E.

Final Panel Comment 4

Existing documentation on the HEC-RAS and HEC-ResSim model analyses for the entire river system is not sufficiently clear, resulting in potentially ambiguous perception of the model results and conclusions.

Basis for Comment

The flood risk assessment and navigational adequacy analyses depend on the hydraulic analyses of the river system. The hydraulic analyses for the river reaches were completed using HEC-RAS. The HEC-Flood Impact Analysis (FIA) model uses data produced by the HEC-RAS model to conduct a flood impact analysis. As documented in the Draft FR/SEIS, the model analyses showed maintenance of an acceptable level of flood risk along the Oostanaula, Etowah, and Coosa Rivers and also showed that the proposed conditions do not appear to expand the extent of flooding to previously unaffected structures beyond a marginal amount. Similarly, the channel availability for navigation was modeled for both a 7.5-foot and 9-foot channel.

Although there is sufficient detail documented on the HEC-FIA model, the details on documentation of the HEC-RAS model are missing. It is understood that the Hydrology and Hydraulics (H&H) Branch of USACE performed the HEC-RAS model. More detailed documentation would improve the transparency of the model analyses of the entire system.

As part of the public comment review, the Panel also noted that, according to the State of Georgia Environmental Protection Division, there is an error in the HEC-ResSim modeling that potentially affects all model runs for the Draft FR/SEIS containing Georgia's storage accounting.

Significance – Low

The HEC-RAS model was completed with appropriate details, but the details on documentation of the link between the HEC-RAS and the other models is not documented and therefore cannot be understood.

Recommendations for Resolution

1. Provide more detailed documentation on the HEC-RAS model assumptions, scenarios, model implementation period, input, and output.
2. Explain how the HEC-RAS model incorporated the effect of climate change into the hydraulic analyses.
3. Release all the models, including HEC-RAS and HEC-ResSim, through a URL link so the Draft FR/SEIS can establish the integrity of its foundation and performance.

Final Panel Comment 5

Errors in the hydropower analysis report, combined with a lack of information on the methodology used to conduct the hydropower analysis, raise concerns about the accuracy of the calculated NED benefits.

Basis for Comment

The hydropower analysis (Appendix D, Attachment 2) was the basis of the hydropower NED benefits used to identify the TSP. The Panel identified numerous errors in the Appendix D, Attachment 2, report that were incorporated into the Draft FR/SEIS. The errors in the hydropower analysis could result in an inaccurate estimate of the NED benefits.

In addition, Appendix D, Attachment 2, lacks detailed explanations of the methods used to develop the hydropower analysis, as cited below.

- a) The Panel could not follow the rationale used to calculate the shaping ratios, as presented in Table 3-6; the possible magnitude of variability, or sensitivity in energy forecast values, as presented in Table 3-7; or the block energy prices, as presented in Table 3-8.
- b) The rationale for using the 50-year ResSim model simulation for the ACT River Basin to evaluate the average dependable capacity for hydropower projects, in lieu of a simulation based on the full period of record (73 years), was not provided.
- c) The rationale for calculating each ACT River Basin hydropower project's weekly average generation, including the use of 1981 as the critical year from the ResSim baseline model run to estimate the dependable capacity for hydropower, was not provided.
- d) The rationale for estimating the hydropower benefits using comparisons to the baseline (current) conditions, in lieu of FWOP conditions, was not provided.

As a result, the Panel is unable to determine if the hydropower analysis is accurate, which could affect the calculation of the NED benefits.

In addition, during the public review period, APC indicated that the reductions in dependable capacity as presented in Appendix D, Attachment 2 may not be realistic for APC projects. APC was unable to duplicate results for capacity values using the assumed dependable capacity impacts (MW) and unit capacity values for the ACT system, as stated in Appendix D, Attachment 2.

Significance – Low

An accurate assessment of the hydropower benefits is needed for selection of the TSP. However, the hydropower benefits accounted for a very small portion of the TSP NED benefits, and therefore any decrease in hydropower should not impact the selection of the TSP.

Recommendations for Resolution

Final Panel Comment 5

1. Verify the accuracy of the hydropower analysis.
2. Provide the rationale for calculating the shaping ratios (Table 3-6); the possible magnitude of variability, or sensitivity in energy forecast values (Table 3-7); and the block energy prices (Table 3-8).
3. Provide the rationale for using the 50-year ResSim model simulation for the ACT River Basin to evaluate the average dependable capacity for hydropower projects.
4. Provide the rationale for calculating each ACT River Basin hydropower project's weekly average generation, including the use of 1981 as the critical year from the ResSim baseline model run to estimate the dependable capacity for hydropower.
5. Provide the rationale for estimating the hydropower benefits using comparisons to the baseline (current) conditions.
6. Verify the calculation of capacity values using the assumed dependable capacity impacts (MW) and unit capacity values for the ACT system.

Final Panel Comment 6

The flood damage analysis does not include a risk assessment, and the Draft FR/SEIS does not include sufficient information on the methodologies used to analyze flood damages and estimate the NED flood damage benefits.

Basis for Comment

In accordance with Engineer Regulation (ER) 1105-2-101, Risk Assessment for Flood Risk Management Studies (USACE, 2017), all flood risk management studies will adopt the risk framework as described in ER 1105-2-101, with the results of a risk assessment being documented in the principal decision document. Based on Section D.8.1.3 (Risk and Uncertainty Factors) of Appendix D, the Panel concluded that a risk assessment was not incorporated into the flood damage analysis.

The report lacks sufficient explanation of how the NED flood damage benefits were estimated. Table 4-6 of the Draft FR/SEIS presents flood damages for the specific flood events based on specific 1979, 1990, and 1995 storm events. The rationale for using the 1979 storm event as the basis for the flood damage analysis NED benefits was not provided. In addition, the Panel believes that the report would be strengthened by presenting the flood damages as average annual damages for the without-project condition and the with-project condition, for each alternative evaluated.

Significance – Low

Presenting the results of the risk assessment in accordance with ER 1105-2-101 will allow for a comprehensive understanding of the NED benefits and project justification.

Recommendations for Resolution

1. Incorporate a risk assessment into the flood damage analysis, in accordance with ER 1105-2-101.
 2. Provide the rationale for using the 1979 storm event as the basis for the flood damage analysis NED benefits.
- OR
3. Present the flood damages as average annual damages for the without-project condition and the with-project condition, for each alternative evaluated.

Literature Cited

USACE (2017). Risk Assessment for Flood Risk Management Studies. Engineer Regulation (ER) 1105-2-101. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C., July 17.

Final Panel Comment 7

It is unclear how the recreation impact zones for Weiss and Logan Martin reservoirs were determined, raising questions about the magnitude of NED benefits for recreation under the TSP.

Basis for Comment

The recreation impact zones for Weiss and Logan Martin lakes, as presented in Appendix D, Attachment 1, were not established prior to the analysis, and therefore had to be developed specifically for this analysis. The Draft FR/SEIS states that the impact zones were based on existing information from APC and public input. Based on the information presented in the Draft FR/SEIS, the Panel was unable to determine how the impact zones for Weiss and Logan Martin lakes were developed. The accuracy and validity of the NED analysis for recreation requires that the impact zones used in the modeling accurately reflect reservoir conditions, which drive recreational activity at the reservoirs and the quality of recreational experiences.

Significance – Low

Accuracy of the NED analysis for recreation, the second largest category of NED benefits, is necessary for an accurate evaluation of alternatives.

Recommendation for Resolution

1. Explain how the recreation impact zones used in the NED recreation analysis for Weiss and Logan Martin lakes were developed.

Final Panel Comment 8

The Draft FR/SEIS does not document how, under the TSP, reductions in flood storage at Weiss and Logan Martin reservoirs would result in reductions in flood damages that meet the requirements of the Coosa Power Act.

Basis for Comment

Section 2.6.1 of the Draft FR/SEIS states that under the proposed changes, Weiss would have a 30 percent reduction in flood storage in winter and 24 percent reduction in summer. Section 2.6.2 states that Logan Martin would have a 35 percent reduction in flood storage in winter and a 35 percent reduction in summer. Further, the 50% exceedance charts for pool elevation (Draft FR/SEIS, Section 5.1.1.1) show that both Weiss and Logan Martin would store more water under normal conditions represented by the medians.

Intuitively, this would be expected to lead to an increase in flood risk downstream (greater storage in more conditions means generally less capacity to capture and store flood waters). But in this case, a reduction in damages is seen. It is not clear from the Draft FR/SEIS how the reduction in flood storage together with other operational changes lead to a reduction in flood damages.

Significance – Low

This is mainly a documentation issue that affects clarity and understanding of how the TSP results in a reduction in flood damages below Weiss and Logan Martin.

Recommendations for Resolution

1. Provide a more detailed explanation, supported by existing or new analysis, about how reductions in flood storage at Weiss and Logan Martin result in reductions in flood damages.
2. Include details about how the operational changes (e.g., new induced surcharge or other rules) or other factors help reduce overall flood damages. If most of the reductions in damages are coming along the shorelines of the lakes (driven by decrease in flood surcharge elevation), then provide details to explain this conclusion.

Final Panel Comment 9

Modeling of the FWOP conditions does not take into account current deviations from the WCM for flood operations at Weiss and Logan-Martin, which could result in flood damage reductions under the TSP being overestimated.

Basis for Comment

As described in the Draft FR/SEIS, Section 4.1.1.1.3 (page 4-2), the APC currently requests and is granted variances to deviate from the WCM. These variances presumably allow APC to avoid exceeding pool elevations above the level at which they currently hold easements. It is not clear from the Draft FR/SEIS that these variances are incorporated into modeling of the FWOP condition.

Significance –Low

Not incorporating variances in the FWOP could lead to a slight overestimate of flood damage reduction under the TSP (if any of those reductions occur along the shorelines of either lake). However, this would not change the overall conclusion that the TSP meets requirements of the Coosa Power Act.

Recommendation for Resolution

1. Re-evaluate assumptions that go into the FWOP condition relative to whether variances from the WCM operations at Weiss and Logan-Martin should be included, and clearly document the decision.

Final Panel Comment 10

The public noted inconsistencies in the mid-point year of construction and the inclusion of specific costs in the joint-use costs as presented in Appendix B, raising concerns about the estimated value of storage being considered for reallocation.

Basis for Comment

Comments submitted on behalf of the Georgia Water Supply Providers questioned the calculation of the value of storage considered for reallocation from Lake Allatoona based on the updated cost of storage method, with specific concerns voiced about the year that was used as the mid-point of construction and the inclusion of the cost of the power plant in the joint-use costs.

Appendix B, Table B.9-4, presents updated joint-use costs of Lake Allatoona based on a mid-point of construction of the lake in 1939. Paragraph B.9.2.4 states that “Costs are updated from “as built” costs in 1953 (the mid-point of construction).”

Table B.9-4 includes the cost of the power plant as a joint-use cost. In accordance with ER 1105-2-100 (USACE, 2000), specific costs (“..the costs of identifiable project features normally serving only one purpose, such as a powerhouse or switch yard” [USACE, 2000; p. E-238]), should be subtracted from the total construction costs when calculating updated storage costs.

Use of the incorrect mid-point of construction and inclusion of specific costs when calculating the updated joint-use costs could impact the calculation of the value of storage being considered for reallocation.

Significance – Low

An accurate estimate of the updated cost of storage is needed to determine the appropriate value of storage being considered for reallocation.

Recommendations for Resolution

1. Verify the mid-point year of construction of Lake Allatoona and update the cost of storage accordingly.
2. Calculate the updated joint-use cost of storage, excluding specific costs.

Literature Cited

USACE (2000). Planning Guidance Notebook. Engineer Regulation (ER) 1105-2-100. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C., April 22.

Final Panel Comment 11

The environmental consequence classification terminology used on Table E-51 related to impacts is not clearly defined, resulting in potential misunderstanding of the significance of some impacts under the alternatives, including the TSP.

Basis for Comment

During review of the public comments, the Panel noted that the Georgia Water Supply Providers (letter from Mr. Lewis B. Jones of King and Spaulding, LLC) states:

2.7 The Criteria Used to Classify Impacts as Either “Negligible” or “Measurable, But Not Appreciable” Should be Disclosed. For each performance measure, the DEIS labels the impact of the proposed action as either “negligible,” “slightly adverse,” “slightly beneficial,” “beneficial” or “adverse,” but it does not explain the basis for these labels. The difference between a “negligible” impact and one that is “measurable, but not appreciable” is unclear. If the distinction is important, the criteria should be disclosed. If it is not, the two categories should be treated as one. This is especially important given that, of all the measures studied, the only impact considered “appreciable” is the beneficial impact of granting the Storage Request.

The Panel agrees that the one-sentence definitions found in Appendix E, page E-159, are not clearly defined such that someone doing an independent assessment could reach the same conclusions. For each parameter assessed, the Draft FR/SEIS labels the impact under the alternatives as either “negligible,” “slightly adverse/slightly beneficial,” “adverse/beneficial,” or “substantially adverse/substantially beneficial,” but it does not clearly document the differences inherent in these labels. Specifically, the difference between an impact formally classified as “negligible” and one that is described informally as “measurable but would not have an appreciable effect” (p. E-159) is unclear. The definition of negligible is something that would not have an appreciable effect.

Significance – Low

The definitions of the consequence classifications within the Draft FR/SEIS and Appendix E are important to the overall clarity of the project documents and the understanding of environmental impacts under the alternatives.

Recommendations for Resolution

1. Provide more detailed definitions for each classification, for each parameter, or provide additional detailed explanation of how differences were determined.

5. REFERENCES

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.

USACE (2017). Risk Assessment for Flood Risk Management Studies. Engineer Regulation (ER) 1105-2-101. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C., July 17.

USACE (2000). Planning Guidance Notebook. Engineer Regulation (ER) 1105-2-100. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C., April 22.

This page is intentionally left blank.

APPENDIX A

IEPR Process for the ACR Study Project

This page is intentionally left blank.

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 Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals (ACR Study 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 the 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 May 15, 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 ACR Study IEPR

Task	Action	Due Date
1	Award/Effective Date	9/9/2019
	Review documents available	11/18/2019
	Public comments available	2/24/2020
	Battelle submits draft Work Plan ^a	9/13/2019
	USACE provides comments on draft Work Plan	9/20/2019
	Battelle submits final Work Plan ^a	10/2/2019
2	Battelle submits list of selected panel members ^a	9/20/2019
	USACE confirms the panel members have no COI	9/30/2019
3	Battelle convenes kick-off meeting with USACE	9/18/2019
	Battelle convenes kick-off meeting with panel members	11/19/2019
	Battelle convenes kick-off meeting with USACE and panel members	11/21/2019
4	Panel members complete their individual reviews	12/19/2019
	Panel members provide draft Final Panel Comments to Battelle	1/9/2020
	Battelle sends public comments to panel members for review	2/24/2020
	Panel confirms two Final Panel Comments are necessary with regard to the public comments	3/4/2020
	Panel finalizes Final Panel Comments	3/12/2020
5	Battelle submits Final IEPR Report to USACE ^a	3/13/2020

Table A-1. Major Milestones and Deliverables of the ACR Study IEPR (continued)

Task	Action	Due Date
6 ^b	Battelle convenes Comment Response Teleconference with panel members and USACE	4/30/2020
	Battelle submits pdf printout of DrChecks project file ^a	5/15/2020
	Agency Decision Milestone (ADM) meeting ^c	4/30/2020
	Contract End/Delivery Date	8/30/2020

^a Deliverable.

^b Task 6 occurs after the submission of this report.

^c 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 ACR Study 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
Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Water Control Manuals (Allatoona-Coosa Reallocation Study)- Feasibility Report & Integrated Supplemental Environmental Impact Statement (Main Report)	282
Appendix A – Operations and Water Control Manuals	992
Appendix B – Plan Formulation	100
Appendix C – Modeling and Engineering	1,053
Appendix D – Economics	192
Appendix E – Environmental Resources	306

Review Documents	No. of Review Pages
Appendix F – Public and Agency Involvement	181
Total Number of Review Pages	3,106
Public Review Comments ^a	Summary Spreadsheet

^a 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.

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)
- USACE Climate Change Adaptation Plan (2015)

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 five 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.

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 ACR Study 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, after the project documents and public comment summary spreadsheet were reviewed (see Section A.5), 11 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 spreadsheet containing a summary of the public comments on the ACR Study 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. The panel members confirmed that two new Final Panel Comments would be developed to summarize the additional issues raised by the IEPR Panel. A panel member was identified by Battelle as the lead author responsible for coordinating the development of each new Final Panel Comment and submitting it to the other panel members and Battelle. The new Final Panel Comments were developed as part of the four-part structure previously described in Section A.4.

Battelle reviewed and edited the two new Final Panel Comments for clarity, consistency with the comment statement, and adherence to guidance on the Panel's overall charge, which included ensuring that the comment did not make any observations regarding either the appropriateness of the selected alternative or USACE policy. There was no direct communication between the Panel and USACE during the preparation of the two 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 11 Final Panel Comments developed by the Panel into 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
ACR Study Project

This page is intentionally left blank.

B.1 Panel Identification

The candidates for the Independent External Peer Review (IEPR) of the Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals (hereinafter: ACR Study IEPR) Panel were evaluated based on their technical expertise in the following key areas: water resources planning, economics, environmental and National Environmental Policy Act (NEPA), and water resources engineering or hydrology. These areas correspond to the technical content of the review documents and overall scope of the ACR Study 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 four 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 U.S. Army Corps of Engineers (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 Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals

1. Previous and/or current involvement by you or your firm in the Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals (hereinafter: Allatoona-Coosa Reallocation [ACR] Study) and related projects.

Panel Conflict of Interest (COI) Screening Questionnaire for the IEPR of the Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals

2. Previous and/or current involvement by you or your firm in water management and reallocation studies and the Alabama, Coosa, and Tallapoosa (ACT) River Basin, including Allatoona Lake, and the Weiss and Logan Martin reservoirs.
3. Previous and/or current involvement by you or your firm in the conceptual or actual design, construction, or operation and maintenance of any projects in the ACR Study 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 ACR Study.
6. Previous and/or current employment or affiliation with members of the Federal, State, County, local and regional agencies, environmental organizations, and interested groups with interest in the results of the ACR Study (*for pay or pro bono*):
 - State of Georgia
 - State of Alabama
 - State of Florida
7. Past, current, or future interests or involvements (financial or otherwise) by you, your spouse, or your children related to the ACT River 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 Mobile District.
9. Previous or current involvement with the development or testing of models that were used for, or in support of, the ACR Study.

Note that the models used in the ACR Study include: Hydrologic Engineering Center (HEC) Reservoir System Simulation (ResSim), HEC-5Q: System Water Quality Modeling, HEC Flood Impact Analysis (FIA), HEC River Analysis System (RAS), HEC Hydrologic Modeling System (HMS).
10. Current firm involvement with other USACE projects, specifically those projects/contracts that are with the Mobile 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 Mobile District. Please explain.

Panel Conflict of Interest (COI) Screening Questionnaire for the IEPR of the Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals

11. Any previous employment by USACE as a direct employee, notably if employment was with the Mobile 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 Mobile 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 water management and reallocation studies, 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 ACR Study.
15. Significant portion of your personal or office's revenues within the last three years came from USACE contracts.
16. Any publicly documented statement (including, for example, advocating for or discouraging against) related to the ACR Study.
17. Participation in relevant prior and/or current Federal studies related to the ACR Study.
18. Previous and/or current participation in prior non-Federal studies related to the ACR Study.
19. Has your research or analysis been evaluated as part of the ACR Study?
20. 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. ACR Study IEPR Panel: Summary of Panel Members

Name	Affiliation	Location	Education	P.E.	Exp. (yrs)
Water Resources Planner					
Mark Lorie	Abt Associates	Boulder, CO	M.S., Environmental Management and Economics	No	17
Economist					
Daniel Maher	DSM Contracting, LLC	River Ridge, LA	M.S., Agricultural Economics	N/A	30+
Environmental and NEPA					
Sandra Scheda	Environmental Science Associates	Tampa, FL	M.S., Zoology	N/A	35
Water Resources Engineer/Hydrologist					
Bijay Panigrahi	AMCON, Inc.	Orlando, FL	Ph.D., Civil Engineering	Yes	36

Table B-2 presents an overview of the credentials of the final four 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. ACR Study IEPR Panel: Technical Criteria and Areas of Expertise

Technical Criterion	Lorie	Maher	Scheda	Panigrahi
Water Resources Planner				
A degree in physical sciences, engineering, or a related field	X			
Demonstrated experience working in states under both Eastern and Western systems of water rights	X			
Experience in the formulation and evaluation of alternatives for water supply for municipal and industrial (M&I) uses to include both surface and groundwater sources	X			
Experience in the assessment of significance of impacts on other project purposes (e.g. flood risk mitigation, hydropower, recreation, water quality, fish & wildlife) at Federal multi-purpose reservoir projects as defined in Engineer Regulation (ER) 1105-2-100	X			
Economist				
Minimum M.S. degree in economics or a related field		X		
Experience in evaluating costs, benefits and impacts related to M&I water supply		X		
Experience forecasting future water use in both urban and rural areas		X		
Experience evaluating the impacts of operational changes in reservoir systems to hydropower, flood risk management, and lake recreation		X		

Table B-2. ACR Study IEPR Panel: Technical Criteria and Areas of Expertise (continued)

Technical Criterion	Lorie	Maier	Scheda	Panigrahi
Experience in applying the methods for determining costs and benefits associated with these project purposes in accordance with the procedures in ER 1105-2-100 and the Water Supply Handbook, Revised Institute for Water Resources (IWR) Report 96-PS-4, dated December 1998		X		
Environmental and NEPA				
Minimum M.S. degree in ecology, biology, or a related field			X	
Experience preparing an environmental impact statement (EIS) in accordance with NEPA			X	
Experience preparing an EIS in accordance with Endangered Species Act (ESA) requirements			X	
Experience in studies related to operational changes in multi-purpose reservoir systems			X	
Experience related to the ecosystems of rivers and lakes in the southeastern United States			X	
Water Resources Engineer/Hydrologist				
Minimum M.S. degree				X
Licensed or registered Professional Engineer				X
Experience building and using rules-based water reservoir simulation models such as HEC-ResSim or RiverWare to analyze alternatives for operation of multi-project and multi-purpose river systems				X
Have a thorough knowledge of applied statistical methods in analyzing streamflow records				X
Experience working on studies of river systems with multiple reservoirs operated for multiple purposes, such as flood control, navigation, water supply, fish and wildlife and recreation.				X
Demonstrable understanding or experience with studies involving hydropower operations, the use of hydraulic models such as HEC-RAS to help determine impacts to flood risk management, and the use of water quality models such as HEC-5Q or similar tools to analyze water quality interactions in both lake and riverine systems				X

B.3 Panel Member Qualifications

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

Name	Mark Lorie
Role	Water Resources Planner
Affiliation	Abt Associates

Mr. Lorie is a water resources planner at Abt Associates. He has more than 17 years of expertise in flood risk, water supply, reservoir operations, and ecological flow assessment. Mr. Lorie received his M.S. in

environmental management and economics in 2002 and took doctoral coursework in environmental systems analysis in 2003 from Johns Hopkins University. He worked for USACE as a water resources planner from 2002 to 2006. He also worked as a water resources planner for the Interstate Commission on the Potomac River Basin between 2006 and 2008, after which he worked as a consultant.

Mr. Lorie's experience includes water management and drought preparedness in both eastern riparian and western prior appropriation contexts. While on staff with the Interstate Commission on the Potomac River Basin, Mr. Lorie served as a leader and technical expert for a regional program on water supply planning and management on behalf of Washington, D.C., metro area water utilities, including the development of models as forecasting tools. He is currently helping USACE develop a framework of drought risk management principles to support Clean Water Act Section 404 permitting processes for proposed water supply reservoirs.

Mr. Lorie has worked on water allocation and reservoir management in the Cache la Poudre River, Colorado; the Potomac River; and the Upper Mississippi River, the Great Lakes, and other areas. He has also worked on water supply planning involving groundwater, wastewater reuse, and other approaches in Virginia, California, and elsewhere. Mr. Lorie facilitated and managed an interagency effort to develop a long-term ecological risk model of the river and ecosystem for the Cache la Poudre River in Northern Colorado. The probabilistic network model covered hydrology, reservoir operations and diversions, native and sport fish habitat, geomorphic processes, riparian ecosystem processes, and other elements. While on staff with USACE, Mr. Lorie assisted in the development of an integrated planning model of operations of Upper Mississippi reservoirs and the impacts on flows within the basin. The integrated model simulated operational rules and resulting lake and river levels. The model was designed to allow for modification of reservoir operational rules and to evaluate whether modifications improved performance in meeting target water levels for purposes of recreation, flood control, water supply, and other purposes.

Mr. Lorie has experience in the formulation and evaluation of alternatives for water supply for municipal and industrial (M&I) uses, including both groundwater and surface water supplies. He is currently leading several technical components of a study evaluating regional water supply benefits (M&I) of a proposed water recycling project in Daly City, California. The study is evaluating the demand for and potential use of recycled water, potential reductions in groundwater pumping if recycled water is used for irrigation of private and public landscaping in the region, and long-term benefits for water availability from the region's aquifer.

Mr. Lorie has experience evaluating the impacts of reservoir operations on flooding, erosion, recreation, hydropower, and water quality. Mr. Lorie developed a model of daily and hourly operations of a hydropower dam that partially controls outflows from Lakes Superior and Michigan to the lower lakes. The model evaluated impacts on electricity production, commercial shipping, and ecosystem functions below the dam and was used to investigate how new water management policies could impact short-term dam operations.

Mr. Lorie has authored and/or co-authored more than 10 manuscripts and made numerous presentations at professional conferences on a variety of topics related to water resource management.

Name	Daniel Maher, PMP
Role	Economist
Affiliation	DSM Contracting, LLC

Mr. Maher is a Project Manager with DSM Contracting and senior economist with over 30 years of experience. He received his M.S. in agricultural economics from Louisiana State University in 1988 and is a certified Project Management Professional. He has served as an economist and project manager on over 50 USACE planning studies and has been responsible for assisting in alternative development and screening and conducting economic analysis in accordance with USACE principles and guidelines. He has managed numerous economic feasibility, evaluation, and impact studies for navigation projects, ecosystem restorations, flood control and flood risk projects, water supply projects, and recreational studies. He has conducted incremental analyses, cost effectiveness studies, and forecasting studies for clients across the country. Mr. Maher's computer skills include extensive experience with IMPLAN Economic Impact Software, IWR-Planning Suite, IWR-MAIN Water Use Forecast System, and the Microsoft Office Suite.

Mr. Maher is familiar with large, complex water resources planning efforts with high public and interagency interest. These efforts have frequently required his expertise in evaluating costs, benefits, and impacts related to M&I water supply, as well as forecasting future water use in both urban and rural areas. Mr. Maher was responsible for assessing the adequacy and acceptability of the economic methods, models, and analyses used to develop a water supply storage assessment of current and future water demands in the upper Apalachicola-Chattahoochee-Flint (ACF) basin as the economist for the ACF River Water Control Manual, Environmental Impact Statement and Water Supply Storage Assessment Report IEPR. He has also conducted other aspects of water use which are often intertwined in complex planning efforts, as demonstrated by the following examples: 1) Water Supply Demand Analysis, Pine Mountain Study Area, Arkansas, which developed an M&I water use forecast as part of the estimation and analysis of water supply benefits; 2) East Baton Rouge Parish Alternative Industrial Water Supply Study Market Demand Analysis, which not only prepared a market forecast but also examined cost, availability, and quality in assessing the ability of industrial users to convert to other water sources; 3) M&I Water Use Forecast, Southwest Florida Feasibility Study, which estimated existing water use and developing water demand projections; and 4) M&I Water Use Forecast, Comprehensive Everglades Restoration Plan (CERP) Forecast Update. During the effort for the M&I Water Use Forecast, Lake Okeechobee Regulation Schedule Study for USACE, Mr. Maher was involved in the development of water supply forecasts for use in estimating the allocation (release) of water from Lake Okeechobee.

Mr. Maher has served as senior economist on several navigation and lake recreation studies for USACE. For the Calcasieu River and Pass, Louisiana, Dredge Material Management Plan Phase II, he updated and finalized the deep draft navigation incremental benefits associated with maintaining navigation on the various reaches of the Calcasieu River and estimating benefit-cost ratios for various operational scenarios. For San Diego Harbor in California, he evaluated the economic feasibility of increasing the current authorized depth of the Federal central harbor and navigation channels to the Tenth Avenue Marine Terminal. As an economist, he was responsible for evaluating the economic feasibility and assessing the operational and environmental impacts resulting from the removal of several underwater natural obstructions (pinnacles) in San Francisco Bay. He has played similar roles on such projects as the Montgomery Point Lock and Dam, McClellan-Kerr Arkansas River Navigation System, Limited

Reevaluation Report, Economic Analysis Update; and the Regional Economic Development, Southwest Arkansas Navigation Study.

Mr. Maher has worked with USACE and with architect/engineering project teams on various Civil Works projects to identify and evaluate costs and benefits in accordance with USACE’s Planning Guidance Notebook (Engineer Regulation [ER] 1105-2-100). He has also served as an economics expert on several USACE IEPR panels, including the Prado Basin Ecosystem Restoration and Water Conservation Integrated Feasibility Report; the Berryessa Creek, Santa Clara County, California, General Reevaluation Study (GRS) Draft General Reevaluation Report and Environmental Impact Statement/Environmental Impact Report; and the General Reevaluation Report for the Truckee Meadows Flood Control Project, Nevada.

Mr. Maher served as the phase manager tasked with conducting cost effectiveness/incremental cost analyses (CE/ICAs) of the costs and benefits of two ecosystem restoration projects: the Canonsburg Lake Ecosystem Restoration Project (USACE, Pittsburgh District) and the Licking River Watershed and Dillon Lake Ecosystem Restoration Project in Dillon, Ohio (USACE, Huntington District). For the Canonsburg project, the analyses were intended to provide decision-makers with a comparison of alternatives that produce different levels of environmental outputs in order to select the alternative that best satisfies project objectives. A total of 37 alternatives (including no action) were developed to address the restoration of Canonsburg Lake. For the Licking River/Dillon Lake project, the work consisted of analyzing alternatives for restoring various reaches of the Licking River that were eroding and impacting the water quality of the river and the downstream Dillon Lake. Sediment from Licking River was also depositing in the lake, resulting in shoals and restricted water flow. Restoration alternatives considered included armoring the bank line, revegetating river bank and near-river bank areas, and dredging portions of the lake to improve water flow and quality.

In addition, Mr. Maher was the Project Manager and/or Senior Economist responsible for several other CE/ICAs: the Incremental Analysis for Four Feasibility Level Studies on the Ohio River Ecosystem Restoration Project (USACE, Louisville District); ICAs for the proposed Hovey Lake restoration project in Indiana (USACE, Louisville District); and a CE/ICA on proposed alternatives for the ecosystem and environmental restoration of the Chicopit Bay at the intersection of the St. Johns River and the Intracoastal Waterway in Florida (USACE, Jacksonville District). For the Ohio River project, major tasks included developing alternatives for meeting the objectives of the project, developing construction costs and environmental output associated with each alternative, and determining the incremental costs of producing environmental output of each cost-effective alternative. The principal elements of the Hovey Lake project were to restore an oxbow habitat and reduce erosion and control sediment for Ohio River overbank flooding. Three alternatives were developed to meet project objectives. Construction costs and environmental output were developed for each alternative, and the cost-effective alternatives and the incremental costs of producing environmental output of each of those alternatives were determined.

Name	Sandra Scheda
Role	Environmental and NEPA
Affiliation	Environmental Science Associates

Ms. Scheda is vice president and Southeast Transportation Services Director at Environmental Science Associates. She earned her M.S. in zoology from the University of South Florida in 1984 and has

35 years of experience conducting environmental planning efforts, biological assessments, and related studies throughout the southeast United States, including Florida, Georgia, and South Carolina. These efforts have included surface and groundwater quality studies, planning/NEPA, construction oversight of environmental elements, and design/permitting. She has also authored journal articles, conducted peer reviews for technical documents, presented at conferences, and taught at the University of South Florida.

Ms. Scheda is familiar with large, complex water resources projects with high public and interagency interest. She has worked on several large water resources projects with multi-agency funding and project development teams. Some examples of these projects include the Tamiami Trail Culverts/Hydrologic Restoration Feasibility Study; the Water Preserve Areas Feasibility Study (Project Implementation Report/Environmental Impact Statement [PIR/EIS]); the C-43 West Basin Reservoir PIR/EIS; and the Site 1 Impoundment PIR/EIS and Strazzulla Wetlands PIR/EIS as a technical reviewer. She was responsible for assessing the adequacy and acceptability of the environmental and NEPA methods, models, and analyses used to develop a water supply storage assessment of current and future water demands in the upper ACF Basin as the environmental and NEPA panel member for the ACF River Water Control Manual, EIS, and Water Supply Storage Assessment Report IEPR.

Ms. Scheda is experienced in the USACE water supply storage reallocation process for Federal water projects with studies that have involved water storage for reallocation based upon modeling. One such project was the C-43 West Basin Reservoir. This reservoir was designed to intercept above-normal flows upstream and redeliver water downstream to match at least the required cubic-foot-per-second rate in the Caloosahatchee River over the Franklin Lock. She is also familiar with and experienced in studies related to operational changes in multi-purpose reservoir systems. Her work on the Water Preserve Areas Feasibility Study for the South Florida Water Management District (SFWMD) included both operational changes and new project components and were prepared in conformance with the NEPA process, CERP regulations, and USACE/District requirements.

Ms. Scheda is experienced in the preparation of EISs in accordance with NEPA. She is thoroughly knowledgeable of the Project Development and Environment (PD&E) guidelines used for development of transportation projects by the Florida Department of Transportation and the NEPA process and related requirements. In addition, she has completed NEPA studies in her areas of expertise for port/marine, water resources, and habitat restoration/CERP projects. She has compiled the required NEPA documents in her areas of expertise under the direction of different lead Federal agencies, including the Federal Highway Administration, Federal Transit Administration, Federal Railroad Administration, Maritime Administration, U.S. Army Corps of Engineers, and U.S. Coast Guard. Example studies include the Kissimmee River Pools D and E Hydrologic Restoration Feasibility Studies; the MacDill Air Force Base Wave Barriers Environmental Assessment/Finding of No Significant Impact; and the SR 7 Extension PD&E Study Wetland Evaluation Report, Endangered Species Biological Assessment/Biological Opinion and Mitigation/Habitat Restoration Plan (for over 300 acres).

Ms. Scheda has extensive experience preparing EISs in accordance with Endangered Species Act (ESA) requirements and has prepared numerous NEPA documents and related Biological Assessments (BAs) in accordance with ESA requirements. She has worked on various levels of NEPA documentation for a wide variety of project types and species. Relevant studies include the C-43 West Basin Reservoir PIR/EIS Design and Permitting, Hendry County, Florida; the L-8 Reservoir Design/Permitting and Construction; and numerous construction/design build projects in the Southeast United States.

Name	Bijay Panigrahi, Ph.D., P.E., P.G., D.WRE, BCEE, CUC
Role	Water Resources Engineer/Hydrologist
Affiliation	AMCON, Inc. and KBC Construction, LLC

Dr. Panigrahi is a Principal Engineer and President of AMCON, Inc. (formerly, BPC Group) and KBC Construction, LLC, in Orlando, Florida. Dr. Panigrahi is a licensed Professional Geologist (P.G.) in Florida and North Carolina, Certified Underground Utility and Excavation Contractor (CUC), Board Certified Environmental Engineer (BCEE), Diplomate, Water Resources Engineering (D.WRE), and a registered Professional Engineer (P.E.) in Florida, Virginia, and Michigan. He received his Ph.D. in civil engineering from Drexel University in 1985, M.S. in civil engineering and geology from Oklahoma State University in 1980, and an M.E. in hydraulic engineering from the Asian Institute of Technology in Thailand in 1978.

Dr. Panigrahi has 36 years of experience in environmental, geotechnical, and water resources engineering, including ground water and surface water modeling. He has directed and managed multi-disciplinary projects involving hydraulics and hydrology (H&H) modeling, flood protection studies, feasibility studies, stormwater management system design, watershed and water quality assessment and modeling, statistical analyses and stochastic modeling, geotechnical and environmental design and studies, seepage and slope stability analyses, foundation analyses, scour and erosion control, water resources facility design, and permitting. Some of the projects involving water supply, reservoir analyses, and inter-basin water transfer include the Modeling Assessment for the C-51 Reservoir Feasibility Analyses; Modeling Water Management Practices in Central Broward County; Frein Reich Preserve Design; and C-51 Basin Rule Development.

Dr. Panigrahi has assessed and designed several canal conveyance systems and water resources control structures such as levees/dikes, culverts, reservoirs, canals, pump stations, and treatment systems using HEC-HMS/RAS/FDA/FIA, MIKESHE/11, RSM, LOWCAP, QUAL2, SEEP2D, FLONET, SLOPEW, SLIDE, and MODFLOW, among others. He is familiar with model building and alternative analyses using reservoir simulation models HEC-ResSim and RiverWare. He has assessed and developed a number of water quality improvement plans, completed optimal network design and implementation plan development, thematic accuracy assessment, and spatial pattern analyses using advanced statistical and geostatistical techniques, including discrete multivariate analyses. Some of these projects include the Optimal Design and Implementation Plan Development for ET Network, Thematic Accuracy Assessment for Seagrass Mapping for 22 Bay Segments and 5 Estuaries, and Water Quality Improvement Analyses for Everglades Agricultural Areas.

Dr. Panigrahi has provided technical expert testimony and litigation support services, including formulation of standard care of opinion, risk assessment, and administrative hearings on several cases in Florida, Michigan, and New Jersey. He has served on peer review panels as the subject expert in hydraulic, hydrology, geotechnical, and environmental engineering. He has reviewed more than 30 hydraulic-hydrodynamic models, which included surface water, groundwater, integrated surface water-ground water, seepage, and numerous watershed water quality models for the Interagency Modeling Center of the SFWMD. Some of these projects include: the C 11 and C-9 impoundments (reservoirs), the C-44 canal design, and the stormwater treatment Area 5&6 expansion. He served as an IEPR Panel member performing hydraulic design review for a number of Hurricane and Storm Damage Risk Reduction System projects for USACE New Orleans District.

Dr. Panigrahi has worked on numerous planning, design, permitting, and construction projects. Most notably, they include gravity bypass, earthen cofferdam, dewatering, traffic control, erosion control, environmental protection for the C-44 Reservoir/STA System Discharge Project, the S-46 Feasibility Study, the Yuca Pen Hydrologic Restoration, and the Site 1 Impoundment (Frein Reich Preserve). Other relevant efforts include designs, plans, and permits for earthen cofferdams, sheet pile and shoring systems, dewatering, traffic control, erosion control, and environmental protection for the SFWMD, U.S. Navy, USACE, Orlando International Airport, and Tampa International Airport, Orange County, among others.

Dr. Panigrahi served on the Florida Board of Professional Engineers (Gubernatorial Appointment) from 2008 to 2012, and has authored more than 50 technical manuals, monographs, and peer-reviewed papers.

This page is intentionally left blank.

APPENDIX C

Final Charge for the ACR Study IEPR

This page is intentionally left blank.

Charge Questions and Guidance to the Panel Members for the Independent External Peer Review (IEPR) of the Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals

This is the final Charge to the Panel for the ACR Study 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 overall study area is the Alabama-Coosa-Tallapoosa (ACT) River Basin. The ACT River Basin includes the Alabama, Coosa, and Tallapoosa rivers and all areas in the basin boundaries from the headwaters downstream to the mouth of the Alabama River, where it joins the Tombigbee River to form the Mobile River. The ACT River Basin at its confluence with the Tombigbee River has a drainage area of 22,739 square miles and covers portions of the states of Alabama, Georgia, and Tennessee.

The U.S. Army Corps of Engineers (USACE) operates five multi-purpose reservoir projects in the ACT River Basin and is responsible for channel maintenance for that portion of the Alabama River from Mile 0 to Claiborne Lock at Mile 72:

- Allatoona Dam and Lake, Georgia
- Carters Dam and Lake and Carters Reregulation Dam, Georgia (functions as a single system)
- Robert F. Henry Lock and Dam and R.E. “Bob” Woodruff Lake, Alabama
- Millers Ferry Lock and Dam and William “Bill” Dannelly Lake, Alabama
- Claiborne Lock and Dam and Lake, Alabama

The Alabama Power Company (APC) operates 11 reservoir projects in the ACT River Basin for the primary purpose of hydroelectric power (hydropower) generation, although these projects provide other public benefits as well. Per Public Law 83-436, USACE has operational oversight for flood risk management (i.e., flood control) and navigation purposes for four of the APC reservoir projects in the ACT River Basin (Weiss, H. Neely Henry, and Logan Martin projects on the Coosa River, and the R.L. Harris project on the Tallapoosa River).

Operations at the five USACE reservoir projects and the four APC reservoir projects with flood risk management and navigation support provisions are guided by a USACE ACT River Basin Master Water Control Manual (WCM) and individual project WCMs. An update of the ACT River Basin Master WCM and individual project WCMs, supported by an Environmental Impact Statement (EIS), was completed in May 2015. During the WCM update process, USACE deferred consideration of two specific requests pending completion of further detailed studies and analyses: (1) a January 2013 updated request (updated again in 2018) from the State of Georgia to reallocate additional reservoir storage in Allatoona Lake to municipal and industrial (M&I) water supply; and (2) an APC request for changes to flood operations at the APC Weiss and Logan Martin projects (including associated updates to the WCMs for those projects).

The purpose of the Allatoona-Coosa Reallocation (ACR) Study is to evaluate the 2018 water supply request from the State of Georgia seeking to reallocate water storage in Allatoona Lake; evaluate proposed revisions to flood operations at two APC projects: Weiss Lake (Reservoir) and the Logan Martin Lake (Reservoir) in the Coosa Basin; and update any water control manuals, as necessary, as a result of

changes in operations. The analysis will be captured in a Feasibility Report and Integrated Supplemental EIS (SEIS), which is defined as the Decision Document.

OBJECTIVES

The objective of this work is to conduct an independent external peer review (IEPR) of the Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals (hereinafter: ACR Study IEPR) in accordance with the Department of the Army, 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			
		Water Resources Planner	Economist	Environmental and NEPA	Water Resources Engineer or Hydrologist
Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Water Control Manuals (Allatoona-Coosa Reallocation Study)- Feasibility Report & Integrated Supplemental Environmental Impact Statement (Main Report)	282	282	282	282	282
App A – Operations and Water Control Manuals	992	992		992	992
App B – Plan Formulation	100		100		
App C – Modeling and Engineering	1,053				1,053
App D – Economics	192	192	192	192	192
App E – Environmental Resources	306			306	
App F – Public and Agency Involvement	181	181	181	181	181
Total Number of Review Pages	3,106	1,647	755	1,953	2,700
Public Review Comments ^{a,b}	250	250	250	250	250

^a USACE will submit public comments to Battelle, which will in turn submit to the IEPR Panel.

^b The public comment page count was not included in the overall review pages because the hours will be considered separately and Options 1, 2, 4, or 5 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)
- USACE Climate Change Adaptation Plan (2015)

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
Meetings	Subcontractors complete mandatory Operations Security (OPSEC) training	11/8/2019
	Battelle sends review documents to panel members	11/12/2019
	Battelle convenes kick-off meeting with panel members	11/13/2019
	Battelle convenes kick-off meeting with USACE and panel members	11/14/2019

Task	Action	Due Date
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	11/26/2019
Review	Panel members complete their individual reviews	12/13/2019
	Battelle provides talking points for Panel Review Teleconference to panel members	12/17/2019
	Battelle convenes Panel Review Teleconference	12/18/2019
	Battelle provides Final Panel Comment templates and instructions to panel members	12/19/2019
	Panel members provide draft Final Panel Comments to Battelle	12/31/2019
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	1/2/2020 - 1/8/2020
	Panel finalizes Final Panel Comments	1/9/2020
Public Comment Review	Battelle receives public comments from USACE	1/16/2020
	Battelle sends public comments to Panel	1/21/2020
	Panel completes its review of public comments	1/24/2020
	Battelle and Panel review the Panel's responses to the charge question regarding the public comments	1/27/2020
	Panel drafts Final Panel Comment for public comments, if necessary	1/29/2020
	Panel finalizes Final Panel Comment regarding public comments, if necessary	1/31/2020
Final Report	Battelle provides Final IEPR Report to panel members for review	2/4/2020
	Panel members provide comments on Final IEPR Report	2/6/2020
	*Battelle submits Final IEPR Report to USACE	2/10/2020
	USACE Planning Center of Expertise (PCX) provides decision on Final IEPR Report acceptance	2/18/2020
Comment Response Process	Battelle inputs Final Panel Comments to Design Review and Checking System (DrChecks) and provides Final Panel Comment	2/20/2020
	Battelle convenes teleconference with Panel to review the Comment Response process	2/20/2020
	USACE Project Delivery Team (PDT) provides draft Evaluator Responses to USACE PCX for review	3/12/2020
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	3/18/2020
	USACE PCX provides draft PDT Evaluator Responses to Battelle	3/19/2020
	Battelle provides draft PDT Evaluator Responses to panel members	3/23/2020
	Panel members provide draft BackCheck Responses to Battelle	3/26/2020

Task	Action	Due Date
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	3/27/2020
	Battelle convenes Comment Response Teleconference with panel members and USACE	3/30/2020
	USACE inputs final PDT Evaluator Responses to DrChecks	4/6/2020
	Battelle provides final PDT Evaluator Responses to panel members	4/7/2020
	Panel members provide final BackCheck Responses to Battelle	4/10/2020
	Battelle inputs panel members' final BackCheck Responses to DrChecks	4/13/2020
	*Battelle submits pdf printout of DrChecks project file	4/14/2020
ADM	Agency Decision Milestone (ADM) Meeting	3/18/2020
	Contract End/Delivery Date	8/30/2020

* 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 for requests or additional information.
3. In case of media contact, notify the Battelle Program Manager, Lynn McLeod (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 Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin Reservoirs Project Control Manuals

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 Review 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 Review 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 Review 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 Review 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 Review 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, 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, 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 the economic or environmental impacts of the 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 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 Members¹

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.
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?

¹ 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.

APPENDIX D

Conflict of Interest Form

This page is intentionally left blank.

David Kaplan
USACE, Institute for Water Resources
August 7, 2019
C-2

Conflicts of Interest Questionnaire
Independent External Peer Review

**Allatoona Lake Water Supply Storage Reallocation Study and Updates to Weiss and Logan Martin
Reservoirs Project Water Control Manuals,
also known as the Allatoona-Coosa Reallocation (ACR) 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

August 07, 2019

Date

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