

Final Independent External Peer Review Report on the Supplemental Environmental Impact Statement (SEIS) for the Mississippi River between the Ohio and Missouri Rivers (Regulating Works)

**Prepared by
Battelle Memorial Institute**

**Prepared for
Department of the Army
U.S. Army Corps of Engineers
Inland Navigation Planning Center of Expertise
Baltimore District**

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Prepared by

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Executive Summary

PROJECT BACKGROUND AND PURPOSE

The St. Louis District (District) of the U.S. Army Corps of Engineers (USACE) is charged with operating and maintaining a navigation channel on the Middle Mississippi River (MMR) that is 9 feet deep and 300 feet wide with additional width in bends as necessary. The MMR is defined as that portion of the Mississippi River that lies between its confluence with the Ohio and the Missouri Rivers. This ongoing project is also commonly referred to as the Regulating Works Project. As authorized by Congress, the Regulating Works Project utilizes bank stabilization, rock removal, and sediment management to maintain bank stability and ensure adequate navigation depth and width. Bank stabilization is achieved by revetment and river training structures, while sediment management is achieved by river training structures. The Regulating Works Project is maintained through dredging and any needed maintenance to existing structural features. The long-term goal of the project, as authorized by Congress, is to obtain and maintain a navigation channel and reduce Federal expenditures by alleviating the amount of annual maintenance dredging through the construction of regulating works. Therefore, pursuant to this authorization, the District continually identifies and monitors areas of the MMR that require frequent and costly dredging to determine if a long-term sustainable solution through regulating works is reasonable. The District also monitors bank stabilization areas to determine if additional work or re-enforcement of existing work is needed to ensure the dependability of the navigation channel.

The environmental impacts of the Regulating Works Project were originally documented in the 1976 Environmental Impact Statement (1976 EIS), Mississippi River between the Ohio and Missouri Rivers (Regulating Works). The 1976 EIS was recently reviewed by the District and by the USACE Planning Center of Expertise for Inland Navigation (PCXIN) to determine whether a supplement to the document should be prepared. The District and the PCXIN concluded that, although the Project had not changed substantially, significant new circumstances and information relevant to the Regulating Works Project and its potential impacts have arisen, warranting consideration of a supplement. The significant new circumstances and information on the potential impacts of the Regulating Works Project include the following:

- New Federally threatened and endangered species have been listed since preparation of the 1976 EIS.
- The District has implemented new programs to restore fish and wildlife habitat on the MMR.
- New information exists on the changes in average river planform width in response to river training structure placement.
- New information exists on the impacts of river training structures on water surface elevations.

- New information exists on the impacts of river training structures and dredging on fish and macroinvertebrates.
- New information exists on the effects of navigation on fish and wildlife resources.
- New information exists on the status of MMR side channels.

Congress provided the manner in which the navigation channel for the MMR should be constructed and maintained via the original Regulating Works Project authorization in 1910 and a modification to the authorization in 1927. The purpose of the Supplemental Environmental Impact Statement (SEIS) is not to consider a change to that authorization through re-evaluating the need for the Regulating Works Project or the methods to be used to accomplish the goals of the project. Rather, the SEIS analyzes the impacts of the Regulating Works Project as it is currently constructed, operated, and maintained with current information that has become available since the completion of the 1976 EIS and with information from recent analyses the District conducted to address data gaps relevant to potential impacts.

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 Supplemental Environmental Impact Statement (SEIS) for the Mississippi River between the Ohio and Missouri Rivers (Regulating Works) (hereinafter: MMR Regulating Works SEIS IEPR). As a 501(c)(3) non-profit science and technology organization, Battelle is independent, free from conflicts of interest (COIs), and meets the requirements for an Outside Eligible Organization (OEO) per guidance described in USACE (2012). Battelle has experience in establishing and administering peer review panels for USACE and was engaged to coordinate the IEPR of the MMR Regulating Works SEIS. The IEPR was external to the agency and conducted following USACE and Office of Management and Budget (OMB) guidance described in USACE (2012) 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 MMR Regulating Works SEIS review documents and the overall scope of the project, Battelle identified potential candidates for the Panel in the following key technical areas: Civil Works planning/economics, biological resources and environmental law compliance, and river engineering. Battelle screened the candidates to identify those most closely meeting the selection criteria and evaluated them for COIs and availability. USACE was given the list of final candidates to confirm that they had no COIs, but Battelle made the final selection of the three-person Panel.

The Panel received electronic versions of the MMR Regulating Works SEIS IEPR review documents (418 pages in total), along with a charge that solicited comments on specific sections of the documents to be reviewed. Following guidance provided in USACE (2012) and OMB (2014), USACE prepared the charge questions, which were included in the draft and final Work Plans.

The USACE Project Delivery Team briefed the Panel and Battelle during a kick-off meeting held via teleconference prior to 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. The Panel produced individual comments in response to the charge questions.

IEPR panel members reviewed the MMR Regulating Works SEIS documents individually. The panel members then met via teleconference with Battelle to review key technical comments and reach agreement on the Final Panel Comments to be provided to USACE. Each Final Panel Comment was documented using a four-part format consisting of: (1) a comment statement; (2) the basis for the comment; (3) the significance of the comment (high, medium/high, medium, medium/low, or low); and (4) recommendations on how to resolve the comment. Overall, four Final Panel Comments of medium/low significance were identified and documented.

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, 2012; p. D-4) in the MMR Regulating Works SEIS 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 MMR Regulating Works SEIS was clear, concise, and documented the impacts that warranted consideration. The Panel did identify several elements of the project that should be clarified or revised in the SEIS.

Plan Formulation: Given the uncertainty regarding the future locations of river training structure construction projects, the process for evaluating and identifying future project locations is a key component of the proposed action. This process is important to understanding the decision-making process, including interagency coordination, and has a bearing on the potential environmental impacts. The process for determining future project locations is briefly described in the responses provided by USACE to Battelle as part of the mid-review teleconference (dated 23 September 2016), but has not been included in the SEIS document.

Engineering: Although the SEIS has little information on the hydraulic and hydrologic engineering data for the MMR, the 1976 EIS on the MMR was reviewed for this data and it was found to be complete and suitable for this SEIS review. One authorized purpose of the MMR Regulating Works Project is to provide an economical and reliable navigation system by minimizing annual maintenance dredging costs and constructing cost-effective regulating works. Strong working knowledge of sediment characteristics is necessary to design and construct effective regulating structures and conduct annual dredging programs. Some information on sediment characteristics is included in several sections of the SEIS, but the data are neither comprehensive nor consolidated. Comprehensive and consolidated sediment data documented in the beginning of the SEIS will improve clarity and strengthen readability.

Environmental: The SEIS recognizes that there will be impacts caused by construction of future river training structure projects and that compensatory mitigation will likely be required. The SEIS also states that the impacts of these projects cannot be quantified at this time because of uncertainty regarding the project locations. However, it appears that a programmatic evaluation (an overall evaluation of the nature and scale of potential environmental impacts) could be performed at least for some specific locations based on existing information.

A clear description of construction features included in the proposed action is critical not only to performing an impact assessment, but also to interpreting the assessment. River training structure terms such as closure structures, chevron dikes, bendway weirs, notched dikes, offset dikes, etc., are

mentioned in the main report with no descriptions. The SEIS would benefit from descriptions and definitions of the physical characteristics and function of these structures.

Table ES-1. Overview of Four Final Panel Comments Identified by the MMR Regulating Works SEIS IEPR Panel

No.	Final Panel Comment
Significance – Medium/Low	
1	It is not clear why impacts of future river training structure construction and the associated compensatory mitigation requirements were not evaluated in more detail with respect to specific locations in the MMR.
2	The project description for the proposed action does not describe the decision-making process that will be employed for identifying new river training structure construction sites.
3	The SEIS does not clearly describe the project construction features within the main report such that a link between the project and the level of impacts can be easily compared.
4	A lack of detailed information on the sediment load entering the MMR limits the understanding of the overall effort needed to achieve the project's stated purpose of providing an economical, regulated, and dredged navigation channel.

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LIST OF ACRONYMS

ATR	Agency Technical Review
COI	Conflict of Interest
DrChecks	Design Review and Checking System
EC	Engineer Circular
EIS	Environmental Impact Statement
ER	Engineer Regulation
ERDC	Engineer Research and Development Center
IEPR	Independent External Peer Review
MMR	Middle Mississippi River
NEPA	National Environmental Policy Act
OEO	Outside Eligible Organization
OMB	Office of Management and Budget
PCXIN	Planning Center of Expertise for Inland Navigation
PDT	Project Delivery Team
SEIS	Supplemental Environmental Impact Statement
SSEA	Site-Specific Environmental Assessments
USACE	United States Army Corps of Engineers

1. INTRODUCTION

The St. Louis District (District) of the U.S. Army Corps of Engineers (USACE) is charged with operating and maintaining a navigation channel on the Middle Mississippi River (MMR) that is 9 feet deep and 300 feet wide with additional width in bends as necessary. The MMR is defined as that portion of the Mississippi River that lies between its confluence with the Ohio and the Missouri Rivers (Figure 1). This ongoing project is also commonly referred to as the Regulating Works Project. As authorized by Congress, the Regulating Works Project utilizes bank stabilization, rock removal, and sediment management to maintain bank stability and ensure adequate navigation depth and width. Bank stabilization is achieved by revetment and river training structures, while sediment management is achieved by river training structures. The Regulating Works Project is maintained through dredging and any needed maintenance to existing structural features. The long-term goal of the project, as authorized by Congress, is to obtain and maintain a navigation channel and reduce Federal expenditures by alleviating the amount of annual maintenance dredging through the construction of regulating works. Therefore, pursuant to this authorization, the District continually identifies and monitors areas of the MMR that require frequent and costly dredging to determine if a long-term sustainable solution through regulating works is reasonable. The District also monitors bank stabilization areas to determine if additional work or re-enforcement of existing work is needed to ensure the dependability of the navigation channel.

The environmental impacts of the Regulating Works Project were originally documented in the 1976 Environmental Impact Statement (1976 EIS), Mississippi River between the Ohio and Missouri Rivers (Regulating Works). The 1976 EIS was recently reviewed by the District and by the USACE Planning Center of Expertise for Inland Navigation (PCXIN) to determine whether a supplement to the document should be prepared. The District and the PCXIN concluded that, although the Project had not changed substantially, significant new circumstances and information relevant to the Regulating Works Project and its potential impacts have arisen, warranting consideration of a supplement. The significant new circumstances and information on the potential impacts of the Regulating Works Project include the following:

- New Federally threatened and endangered species have been listed since preparation of the 1976 EIS.
- The District has implemented new programs to restore fish and wildlife habitat on the MMR.
- New information exists on the changes in average river planform width in response to river training structure placement.
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- New information exists on the impacts of river training structures and dredging on fish and macroinvertebrates.
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- New information exists on the status of MMR side channels.

Congress provided the manner in which the navigation channel for the MMR should be constructed and maintained via the original Regulating Works Project authorization in 1910 and a modification to the authorization in 1927. The purpose of the Supplemental Environmental Impact Statement (SEIS) is not to consider a change to that authorization through re-evaluating the need for the Regulating Works Project

or the methods to be used to accomplish the goals of the project. Rather, the SEIS analyzes the impacts of the Regulating Works Project as it is currently constructed, operated, and maintained with current information that has become available since the completion of the 1976 EIS and with information from recent analyses the District conducted to address data gaps relevant to potential impacts.



Figure 1. The Middle Mississippi River (MMR)

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 Supplemental Environmental Impact Statement (SEIS) for the Mississippi River between the Ohio and Missouri Rivers (Regulating Works) (hereinafter: MMR Regulating Works SEIS IEPR) in accordance with procedures described in the Department of the Army, USACE, Engineer Circular (EC) *Civil Works Review* (EC 1165-2-214) (USACE, 2012) 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 MMR Regulating Works SEIS IEPR documents (Section 4). Appendix A describes in detail how the IEPR was planned and conducted. 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 on September 8, 2016. Appendix D presents the organizational conflict of interest form that Battelle completed and submitted to the Institute for Water Resources prior to the award of the MMR Regulating Works SEIS 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 (ATR), as described in USACE (2012).

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 MMR Regulating Works SEIS was conducted and managed using contract support from Battelle, which is an Outside Eligible Organization (OEO) (as defined by EC 1165-2-214). 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. Table 1 presents the major milestones and deliverables of the MMR Regulating Works SEIS IEPR. Due dates for milestones and deliverables are based on the award/effective date of August 24, 2016. Note that the work items listed under Task 6 as well as the public comment review occur after the submission of this report. Battelle anticipates submitting the final pdf printout of the USACE's Design Review and Checking System (DrChecks) project file (the final deliverable) on February 15, 2017. The actual date for contract end will depend on the date that all activities for this IEPR are completed.

Table 1. Major Milestones and Deliverables of the MMR Regulating Works SEIS IEPR

Task	Action	Due Date
1	Award/Effective Date	8/24/2016
	Review documents available	8/25/2016
2	Battelle submits list of selected panel members	8/31/2016
	USACE confirms the panel members have no COI	9/2/2016

Table 1. Major Milestones and Deliverables of the MMR Regulating Works SEIS IEPR (continued)

Task	Action	Due Date
3	Battelle convenes kick-off meeting with USACE	8/29/2016
	Battelle convenes kick-off meeting with USACE and panel members	9/13/2016
4	Panel members complete their individual reviews	9/21/2016
	Panel members provide draft Final Panel Comments to Battelle	10/4/2016
5	Battelle submits Final IEPR Report to USACE	10/13/2016
6 ^a	Battelle convenes Comment-Response Teleconference with panel members and USACE	11/29/2016
	Battelle submits pdf printout of DrChecks project file to USACE	12/21/2016
4 ^a	Panel completes its review of public comments	12/29/2016
	Panel drafts Final Panel Comment for public comments, if necessary	1/3/2017
5 ^a	Battelle submits Addendum to the Final IEPR Report	1/9/2017
6 ^a	Battelle convenes Comment-Response Teleconference with panel members and USACE to address Final Panel Comment related to the public comments, if necessary	2/7/2017
	Battelle submits pdf printout of DrChecks project file	2/15/2017
	Contract End/Delivery Date	9/29/2017

^a Tasks that occur after the submission of this report.

Battelle identified, screened, and selected three panel members to participate in the IEPR based on their expertise in the following disciplines: Civil Works planning/economics, biological resources and environmental law compliance, and river engineering. The Panel reviewed the MMR Regulating Works SEIS document and produced four Final Panel Comments in response to 19 charge questions provided by USACE for the review. This charge included two overview questions and one public comment question added by Battelle. 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 1165-2-214, Appendix D), 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, 2012; p. D-4) in the MMR Regulating Works SEIS IEPR review documents. The following summarizes the Panel's findings.

Plan Formulation: Given the uncertainty regarding the future locations of river training structure construction projects, the process for evaluating and identifying future project locations is a key component of the proposed action. This process is important to understanding the decision-making process, including interagency coordination, and has a bearing on the potential environmental impacts. The process for determining future project locations is briefly described in the responses provided by USACE to Battelle as part of the mid-review teleconference (dated 23 September 2016), but has not been included in the SEIS document.

Engineering: Although the SEIS has little information on the hydraulic and hydrologic engineering data for the MMR, the 1976 EIS on the MMR was reviewed for this data and it was found to be complete and suitable for this SEIS review. One authorized purpose of the MMR Regulating Works Project is to provide an economical and reliable navigation system by minimizing annual maintenance dredging costs and constructing cost-effective regulating works. Strong working knowledge of sediment characteristics is necessary to design and construct effective regulating structures and conduct annual dredging programs. Some information on sediment characteristics is included in several sections of the SEIS, but the data are neither comprehensive nor consolidated. Comprehensive and consolidated sediment data documented in the beginning of the SEIS will improve clarity and strengthen readability.

Environmental: The SEIS recognizes that there will be impacts caused by construction of future river training structure projects and that compensatory mitigation will likely be required. The SEIS also states that the impacts of these projects cannot be quantified at this time because of uncertainty regarding the project locations. However, it appears that a programmatic evaluation (an overall evaluation of the nature and scale of potential environmental impacts) could be performed at least for some specific locations based on existing information.

A clear description of construction features included in the proposed action is critical not only to performing an impact assessment, but also to interpreting the assessment. River training structure terms such as closure structures, chevron dikes, bendway weirs, notched dikes, offset dikes, etc., are mentioned in the main report with no descriptions. The SEIS would benefit from descriptions and definitions of the physical characteristics and function of these structures.

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

It is not clear why impacts of future river training structure construction and the associated compensatory mitigation requirements were not evaluated in more detail with respect to specific locations in the MMR.

Basis for Comment

The SEIS recognizes that there will be impacts caused by future river training structure construction projects and that compensatory mitigation will likely be required (documented in Attachment 1 to Appendix C). The SEIS also states that the impacts of these projects cannot be quantified at this time because of uncertainty regarding the project locations. However, it appears that a programmatic evaluation (an overall evaluation of the nature and scale of potential environmental impacts) could be performed at least for some specific locations based on existing information.

The Project Delivery Team (PDT) maintains a prioritized list of dredging sites that is updated annually based on the prior season's dredging requirements. This priority list could be used to identify potential future river training structure construction sites. Furthermore, the types of river training structure structures that would typically be suitable for conditions at these sites could be identified. This programmatic-level evaluation would provide descriptions of typical construction projects that could be used to better estimate the nature and scale of potential environmental impacts.

During preparation of site-specific environmental assessments (SSEAs), the programmatic project description and impact assessment could provide an updated plan as additional dredging information becomes available in the future. As a result, the SEIS and subsequent tiered National Environmental Policy Act (NEPA) documentation could disclose potential environmental impacts in a more meaningful manner.

Significance – Medium/Low

By not using available information to predict the location of future river training structure construction sites, there is increased uncertainty that the projected impacts and required compensatory mitigation requirements are accurate.

Recommendation for Resolution

1. Develop a programmatic plan for future river training structure construction projects. Use the existing dredging priority list to predict the potential locations of future river training structure construction sites. Prepare preliminary designs and impact assessments for the example construction sites.
2. Document updates of the programmatic plan for river training structure construction projects as new information is obtained in SSEAs.

Final Panel Comment 2

The project description for the proposed action does not describe the decision-making process that will be employed for identifying new river training structure construction sites.

Basis for Comment

Given the uncertainty regarding the future locations of river training structure construction projects, the process for evaluating and identifying future project locations is a key component of the proposed action. This process is important to understanding the decision-making process including interagency coordination and has a bearing on the potential environmental impacts. The process for determining future project locations is briefly described in the responses provided by USACE to Battelle as part of the mid-review teleconference (dated 23 September 2016) but has not been described in the document.

Significance – Medium/Low

Without a clear description of the decision-making process in the SEIS, the project description of the proposed action is not complete and the description of potential impacts cannot be verified.

Recommendation for Resolution

1. Add a description of how future river training structure construction projects will be evaluated and identified, tools to be used (such as the dredging priority list and how it is developed), interagency coordination, and any other pertinent factors.

Final Panel Comment 3

The SEIS does not clearly describe the project construction features within the main report such that a link between the project and the level of impacts can be easily compared.

Basis for Comment

A clear description of construction features included in the proposed action is critical not only to performing an impact assessment, but also to interpreting the assessment. River training structure terms such as closure structures, chevron dikes, bendway weirs, notched dikes, offset dikes, etc., are mentioned in the main report with no descriptions. The SEIS would benefit from descriptions and definitions of the physical characteristics and function of these structures.

The main SEIS contains a reference to Appendix F for descriptions of the river training structures. However, Appendix F contains documentation of the analysis for determining eligibility for the National Register of Historic Places, which is not an obvious location to find a project description. Inasmuch as the project description is critical to a clear understanding of potential impacts, it should be included in the main SEIS and not an appendix where it could go unnoticed.

Significance – Medium/Low

Without providing a clear description of the project construction features, the adequacy of the impact assessment cannot be interpreted.

Recommendation for Resolution

1. Move the descriptions of the river training structures from Appendix F to the description of alternatives in Chapter 2 of the main SEIS.

Final Panel Comment 4

A lack of detailed information on the sediment load entering the MMR limits the understanding of the overall effort needed to achieve the project's stated purpose of providing an economical, regulated, and dredged navigation channel.

Basis for Comment

One authorized purpose of the MMR Regulating Works Project is to provide an economical and reliable navigation system by minimizing annual maintenance dredging costs and constructing cost-effective regulating works. Strong working knowledge of sediment characteristics is necessary to design and construct effective regulating structures and conduct annual dredging programs. Some information on sediment characteristics is included in several sections of the SEIS, but the data are neither comprehensive nor consolidated. Comprehensive and consolidated sediment data documented in the beginning of the SEIS will improve clarity and strengthen readability. In addition, the Panel will be able to judge whether structures and dredging designs are based on robust data, science, and engineering.

Consider the following data set:

- Annual percentages and load from Missouri River and Upper Mississippi River.
- Sediment properties for both bed load and suspended load – particle size, settling velocity, specific gravity, and fraction distribution within each particle size.
- Annual volumes entering the MMR, temporarily and permanently deposited in the MMR, and exiting the MMR as compared to annual dredging load.
- Relationship between channel conveyance, flood hydrographs (i.e., rising leg and falling leg), bed load, suspended sediment load, and sediment transportation.
- Percentage of total bed load and suspended sediment load that is dredged.

Significance – Medium/Low

A more comprehensive description of sediment characteristics and sediment transport would promote a better understanding of sediment loads entering the MMR and of impacts on channel dredging and regulating works.

Recommendation for Resolution

1. Place a sediment data set in either SEIS Chapter 3 – Affected Environment, Section 3.2.2, Geomorphology – or in an appendix.
2. Develop an engineering appendix that consolidates Sedimentation, River Engineering, and Potamology into one place.

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 (2012). Water Resources Policies and Authorities: Civil Works Review. Engineer Circular (EC) 1165-2-214. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. December 15.

APPENDIX A

IEPR Process for the MMR Regulating Works SEIS Project

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

Table A-1 presents the schedule followed in executing the Supplemental Environmental Impact Statement (SEIS) for the Mississippi River between the Ohio and Missouri Rivers (Regulating Works) Independent External Peer Review (hereinafter: MMR Regulating Works SEIS IEPR). Due dates for milestones and deliverables are based on the award/effective date of August 24, 2016. The review documents were provided by U.S. Army Corps of Engineers (USACE) on August 25, 2016. Note that the work items listed under Task 6 and activities regarding the public comment review occur after the submission of this report.

Battelle will enter the four Final Panel Comments developed by the Panel into USACE's Design Review and Checking System (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.

Table A-1. MMR Regulating Works SEIS Complete IEPR Schedule

Task	Action	Due Date
1	Award/Effective Date	8/24/2016
	Review documents available	8/25/2016
	Battelle submits draft Work Plan ^a	8/31/2016
	USACE provides comments on draft Work Plan	9/2/2016
	Battelle submits final Work Plan ^a	9/8/2016
2	Battelle requests input from USACE on the conflict of interest (COI) questionnaire	8/25/2016
	USACE provides comments on COI questionnaire	8/29/2016
	Battelle submits list of selected panel members ^a	8/31/2016
	USACE confirms the panel members have no COI	9/2/2016
	Battelle completes subcontracts for panel members	9/9/2016
3	Battelle convenes kick-off meeting with USACE	8/29/2016
	Battelle sends review documents to panel members	9/12/2016
	Battelle convenes kick-off meeting with panel members	9/13/2016
	Battelle convenes kick-off meeting with USACE and panel members	9/13/2016
	Battelle convenes Mid-Review Teleconference for panel members to ask clarifying questions of USACE	9/21/2016

Table A-1. MMR Regulating Works SEIS Complete IEPR Schedule (continued)

Task	Action	Due Date
4 SEIS Review	Panel members complete their individual reviews	9/21/2016
	Battelle provides panel members with talking points for Panel Review Teleconference	9/22/2016
	Battelle convenes Panel Review Teleconference	9/23/2016
	Battelle provides Final Panel Comment templates and instructions to panel members	9/23/2016
	Panel members provide draft Final Panel Comments to Battelle	10/4/2016
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	10/5/2016-10/10/2016
	Panel finalizes Final Panel Comments	10/11/2016
5 SEIS – Final Report	Battelle provides Final IEPR Report to panel members for review	10/12/2016
	Panel members provide comments on Final IEPR Report	10/13/2016
	Battelle submits Final IEPR Report to USACE ^a	10/13/2016
	USACE Planning Center of Expertise (PCX) provides decision on Final IEPR Report acceptance	10/21/2016
6 SEIS – Comment Response Process^b	Battelle inputs Final Panel Comments to DrChecks and provides Final Panel Comment response template to USACE	10/25/2016
	Battelle convenes teleconference with USACE to review the Comment Response Process	10/25/2016
	Battelle convenes teleconference with Panel to review the Comment Response Process	10/25/2016
	USACE Project Delivery Team (PDT) provides draft Evaluator Responses to USACE PCX for review	11/8/2016
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	11/15/2016
	USACE PCX provides draft PDT Evaluator Responses to Battelle	11/16/2016
	Battelle provides draft PDT Evaluator Responses to panel members	11/18/2016
	Panel members provide Battelle with draft BackCheck Responses	11/23/2016
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	11/28/2016
	Battelle convenes Comment-Response Teleconference with panel members and USACE	11/29/2016
	USACE inputs final PDT Evaluator Responses to DrChecks	12/6/2016
	Battelle provides final PDT Evaluator Responses to panel members	12/8/2016
	Panel members provide Battelle with final BackCheck Responses	12/13/2016

Table A-1. MMR Regulating Works SEIS Complete IEPR Schedule (continued)

Task	Action	Due Date
6 SEIS – Comment Response Process^b	Battelle inputs the Panel’s final BackCheck Responses in DrChecks	12/20/2016
	Battelle submits pdf printout of DrChecks project file ^a	12/21/2016
4 Public Comments – Review and Final Panel Comments^b	Battelle receives public comments from USACE	12/22/2016
	Battelle sends public comments to Panel	12/22/2016
	Panel completes its review of public comments	12/29/2016
	Battelle and Panel review Panel's responses to public comments	12/30/2016
	Panel drafts Final Panel Comment for public comments, if necessary	1/3/2017
	Panel finalizes Final Panel Comment regarding public comments	1/9/2017
5 Public Comment – Addendum^b	Battelle submits Addendum to the Final IEPR Report ^a	1/9/2017
	USACE PCX provides decision on Addendum to the Final IEPR Report acceptance	1/17/2017
6 Public Comments – Comment Response Process^b	Battelle inputs Final Panel Comments to DrChecks and provides Final Panel Comment response template to USACE	1/19/2017
	USACE PDT provides draft Evaluator Responses to USACE PCX for review	1/26/2017
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	1/30/2017
	USACE PCX provides draft PDT Evaluator Responses to Battelle	1/31/2017
	Battelle provides draft PDT Evaluator Responses to panel members	2/1/2017
	Panel members provide draft BackCheck Responses to Battelle	2/3/2017
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	2/6/2017
	Battelle convenes Comment-Response Teleconference with panel members and USACE	2/7/2017
	USACE inputs final PDT Evaluator Responses to DrChecks	2/9/2017
	Battelle provides PDT Evaluator Responses to panel members	2/9/2017
	Panel members provide final BackCheck Responses to Battelle	2/13/2017
	Battelle inputs panel members' final BackCheck Responses to DrChecks	2/14/2017
	Battelle submits pdf printout of DrChecks project file ^a	2/15/2017
	Contract End/Delivery Date	9/29/2017

^a Deliverable.^b Tasks occur after the submission of this report.

At the beginning of the Period of Performance for the MMR Regulating Works SEIS 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., clarify expertise areas needed for panel members). Any revisions to the schedule were submitted as part of the final Work Plan. The final charge consisted of 19 charge questions provided by USACE, two overview questions 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 within four days of their subcontracts being 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 MMR Regulating Works SEIS review documents and reference materials listed in Table A-2 below.

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

Review Documents	No. of Review Pages	Subcontractor Disciplines		
		Civil Works Planning/Economics	Bio. Resources and Environmental Law Compliance	River Engineer
Regulating Works Project, Draft SEIS	241	241	241	241
Appendix A: Effects of River Training Structures on Flood Levels	30	30	30	30
Appendix B: Biological Assessment	11		11	
Appendix C: Habitat Loss, Mitigation Needs, and Adaptive Management	23		23	
Appendix D: Section 404(b)(1) Evaluation	36		36	
Appendix F: Determination of National Register Eligibility	59	59	59	
Appendix F: Supplement	18	18	18	18
Total number of pages to be reviewed	418	348	418	289
Supplemental Information				
Public Comments ^a	100	100	100	100
1976 Regulating Works EIS	602	602	602	602
Total number of pages provided for reference	702	702	702	702

^a USACE will submit public comments to Battelle upon their availability in December 2016, who will in turn submit the comments to the IEPR Panel for review. A separate Addendum to the Final Report will be submitted if additional Final Panel Comments are necessary.

Documents for Reference

- USACE guidance *Civil Works Review*, (EC 1165-2-214, December 15, 2012)
- Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* (December 16, 2004)
- USACE Climate Change Adaptation Plan (June 2014)

Close to the end of the review of the MMR Regulating Works SEIS IEPR documents, a teleconference was held with USACE, the Panel, and Battelle so that USACE could answer any questions the Panel had concerning either the review documents or the project. Battelle submitted 12 panel member questions to USACE. USACE 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 in a preliminary list of four 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 2-hour 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 prepared 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 MMR Regulating Works SEIS 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:** Describes a fundamental issue with the project that affects the current recommendation or justification of the project, and which will affect its future success, if the project moves forward without the issue being addressed. Comments rated as high indicate that the Panel determined that the current methods, models, and/or analyses contain a “showstopper” issue.
 2. **Medium/High:** Describes a potential fundamental issue with the project, which has not been evaluated at a level appropriate to this stage in the Planning process. Comments rated as medium/high indicate that the Panel analyzed or assessed the methods, models, and/or analyses available at this stage in the Planning process and has determined that if the issue is not addressed, it could lead to a “showstopper” issue.
 3. **Medium:** Describes an issue with the project, which does not align with the currently assessed level of risk assigned at this stage in the Planning process. Comments rated as medium indicate that, based on the information provided, the Panel identified an issue that would raise the risk level if the issue is not appropriately addressed.
 4. **Medium/Low:** Affects the completeness of the report at this time in describing the project, but will not affect the recommendation or justification of the project. Comments rated as medium/low indicate that the Panel does not currently have sufficient information to analyze or assess the methods, models, or analyses.
 5. **Low:** Affects the understanding or accuracy of the project as described in the report, but will not affect the recommendation or justification of the project. Comments rated as low indicate that the Panel identified information that was mislabeled or incorrect or that certain data or report section(s) were not clearly described or presented.
- 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, four 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 Final Panel Comments are presented in the main report.

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APPENDIX B

Identification and Selection of IEPR Panel Members
for the MMR Regulating Works SEIS Project

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B.1 Panel Identification

The candidates for the Supplemental Environmental Impact Statement (SEIS) for the Mississippi River between the Ohio and Missouri Rivers (Regulating Works) (hereinafter: MMR Regulating Works SEIS IEPR) Panel were evaluated based on their technical expertise in the following key areas: Civil Works planning/economics, biological resources and environmental law compliance, and river engineering. These areas correspond to the technical content of the MMR Regulating Works SEIS IEPR review documents and overall scope of the MMR Regulating Works SEIS 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 three 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.

The candidates were screened for the following potential exclusion criteria or COIs.¹ These COI questions serve as a means of disclosure and to better characterize a candidate's employment history and background. 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.

- Previous and/or current involvement by you or your firm² in development of the SEIS for the Mississippi River between the Ohio and Missouri Rivers (Regulating Works) and its appendices.
- Previous and/or current involvement by you or your firm² in any work related to Mississippi River navigation channels and especially work in the Middle Mississippi River (MMR) that is defined as that portion of the Mississippi River that lies between its confluence with the Ohio and the Missouri Rivers.
- Previous and/or current involvement by you or your firm² in the conceptual or actual design, construction, or operation and maintenance (O&M) of the Regulating Works, any projects in the Mississippi River between the Ohio and Missouri Rivers, or related projects.
- Current employment by the U.S. Army Corps of Engineers (USACE).

¹ Battelle evaluated whether scientists in universities and consulting firms that are receiving USACE-funding have sufficient independence from USACE to be appropriate peer reviewers. See OMB (2004, p. 18), "...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."

² Includes any joint ventures in which a panel member's firm is involved and if the firm serves as a prime or as a subcontractor to a prime.

- Previous and/or current involvement with paid or unpaid expert testimony related to the SEIS for the Mississippi River between the Ohio and Missouri Rivers (Regulating Works) and related projects.
- Previous and/or current employment or affiliation with any cooperating state, county, local, and regional agencies, environmental organizations, and interested groups (for pay or pro bono).
- Past, current, or future interests or involvements (financial or otherwise) by you, your spouse, or your children, including owning property adjacent to the river in the Regulating Works project area, between the Ohio and the Missouri Rivers.
- 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 St. Louis District.
- Previous or current involvement with the development or testing of models that will be used for, or in support of the SEIS for the Mississippi River between the Ohio and Missouri Rivers (Regulating Works) project.
- Current firm² involvement with other USACE projects, specifically those projects/contracts that are with the St. Louis 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 St. Louis District. Please explain.
- Any previous employment by USACE as a direct employee, notably if employment was with the St. Louis District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
- Any previous employment by USACE as a contractor (either as an individual or through your firm²) within the last 10 years, notably if those projects/contracts are with the St. Louis District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
- Previous experience conducting technical peer reviews. If yes, please highlight and discuss any technical reviews concerning navigation channels or other features of the Mississippi River, and include the client/agency and duration of review (approximate dates).
- Pending, current, or future financial interests in SEIS for the Mississippi River between the Ohio and Missouri Rivers (Regulating Works) project and related contracts/awards from USACE.
- Significant portion of your personal or office's revenues within the last three years came from USACE contracts.
- Any publicly documented statement (including, for example, advocating for or discouraging against) related to SEIS for the Mississippi River between the Ohio and Missouri Rivers (Regulating Works)
- Participation in relevant prior and/or current Federal studies relevant to this project and/or the Mississippi River between the Ohio and Missouri Rivers Regulating Works
 - 1976 Environmental Impact Statement – Mississippi River between the Ohio and Missouri Rivers (Regulating Works).

- Mississippi River: Actions Are Needed to Help Resolve Environmental and Flooding Concerns about the Use of River Training Structures (GAO-12-41)
- 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.
- Has your research or analysis been evaluated as part of the SEIS?

Other considerations:

- Participation in previous USACE technical review panels
- Other technical review panel experience.

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. All three of the final reviewers are affiliated with consulting companies. 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 presents an overview of the credentials of the final three members of the Panel and their qualifications in relation to the technical evaluation criteria. More detailed biographical information regarding each panel member and his area of technical expertise is given in Section B.3.

Table B-1. MMR Regulating Works SEIS IEPR Panel: Technical Criteria and Areas of Expertise

Technical Criterion	Hornung	Newling	Fischer
Civil Works Planner/Economist			
Minimum 10 years of demonstrated experience in public works planning	X		
Familiarity with USACE plan formulation process, procedures, and standards	X		
Familiarity with USACE mitigation planning procedures and standards	X		
Familiarity with evaluation or alternative plans for inland navigation projects	X		
Biological Resources and Environmental Law Compliance			
At least 15 years of experience directly related to water resource environmental evaluation or review and National Environmental Policy Act (NEPA) compliance		X	
Minimum M.S. degree or higher in a related field		X	
Prior experience in the preparation and/or review of Environmental Impact Statements		X	
Familiarity with the habitat, fish and wildlife species that may be affected in this study area		X	
Experience related to biological or environmental issues associated with regulating works on navigable waterways		X	
An expert in compliance with the Clean Water Act, Endangered Species Act, Fish and Wildlife Coordination Act, and the National Historic Preservation Act		X	
River Engineering			
Must hold a B.S and M.S degree in civil engineering from an Accreditation Board for Engineering and Technology (ABET) accredited University and be a Professional Engineer (P.E.) in the related field			X
At least 15 years of experience in the field of river engineering on navigable waterways, with specific expertise in navigation channel design through the use of river training structures (groynes, dikes), revetments and dredging			X
Thorough understanding of physical effect of river training structures on river bathymetry, velocities, and water surfaces; river data collection; and river geomorphology			X
Thorough understanding of both physical and multi-dimensional numeric hydraulic modeling			X

B.3 Panel Member Qualifications

Lewis Hornung

Role: Civil Works Planner/Economist

Affiliation: DR Reed & Associates, Inc.

Mr. Hornung is a planning expert with DR Reed & Associates in Jupiter, Florida, specializing in the planning, economics, design phase, and operation of water resources and public works projects. He earned his B.S. in civil engineering from the University of Houston. His 39-year career includes 19 years with USACE, 7 with the South Florida Water Management District, and 13 with architectural/engineering firms. Mr. Hornung has worked on dozens of USACE Civil Works projects since 1977, applying Principles and Guidelines (P&G). He has taken part in previous IEPR panels for Battelle as an economist/Civil Works planning expert.

Mr. Hornung has direct experience in USACE plan formulation process, procedures, and standards. He spent more than 12 years in the Planning Divisions of the Galveston and Jacksonville Districts. He applied the USACE six-step planning process, governed by Engineer Regulation (ER) 1105-2-100 (Planning Guidance Notebook), for dredged material management plans, reconnaissance studies, feasibility studies, limited reevaluation reports, general reevaluation reports, major rehabilitation reports, and continuing authority studies. His experience includes inland, deep- and shallow-draft navigation, structural and non-structural flood risk management projects, water quality, and water supply studies. Relevant studies include the Corpus Christi Deep Draft Navigation Feasibility Study (deep draft), Victoria Barge Canal Feasibility Study (inland shallow draft), Bayou Sorrel Lock Replacement (inland shallow draft), Calcasieu Lock Feasibility Study (inland shallow draft), Houma Navigation Canal Deepening Feasibility Study (inland deep draft), Port of Iberia Feasibility Study (deep draft), and Redwood City Navigation Improvement Feasibility Report (deep draft).

Mr. Hornung also has direct experience with mitigation planning procedures and standards. He has led efforts for many projects to avoid and minimize environmental impacts and, when necessary, to identify cost-effective mitigation measures. Projects in which it has been necessary for Mr. Hornung to identify such measures include the Calcasieu Lock Feasibility Study and the Pajaro River Flood Risk Management Feasibility Study. Mr. Hornung has more than 30 years of experience conducting traditional National Economic Development (NED) plan benefits analyses associated with inland navigation and flood risk management projects. This includes economic analyses for the Alexandria to the Gulf Flood Risk Management Feasibility Study, C-111 General Reevaluation Report (flood risk management), Houma Navigation Canal Feasibility Report, and Redwood City Navigation Improvement Feasibility Study.

Charles Newling, PWS, CWB, CWD**Role:** Biological Resources and Environmental Law Compliance**Affiliation:** Wetland Science Applications, Inc.

Mr. Newling is senior wetland regulatory scientist and senior vice president of Wetland Science Applications, Inc., and the Wetland Training Institute, Inc. He earned his M.S. in zoology (wildlife ecology) from Southern Illinois University in 1975. His 41-year career has focused on environmental evaluation of water resources in both the public and private sectors for compliance with the Clean Water Act (CWA) and NEPA. Mr. Newling has specialized knowledge of a broad array of environmental laws, with a strong focus on the requirements of the CWA, NEPA, the Rivers and Harbors Act (RHA), the Fish and Wildlife Coordination Act, the Endangered Species Act, and the National Historic Preservation Act. Compliance with these laws, including evaluation under the National Historic Preservation Act, is required to secure federal permits under Section 10 of the RHA and Section 404 of the CWA.

He is familiar with the habitat, and fish and wildlife species of this area, gained through experience working on projects on the Mississippi River, and on other similar rivers in this general area. Mr. Newling has worked on projects on the Mississippi River, the Great Lakes and the Illinois River eco-region. His consulting work spans the ecology of the Upper Midwest as far back as 1975 when he authored studies used by the St. Louis District in preparation for its EIS for the replacement of Lock and Dam 26 on the Mississippi River³. In addition, his expertise includes evaluating ecosystem restoration technologies for mitigation of potential impacts from proposed projects. He has a strong knowledge of the ecology of wetlands, wet prairies, streams, and interconnected habitat, having conducted functional analyses of these environments since 1975.

Mr. Newling has experience calculating average annual habitat units and applying the calculations to determine mitigation or restoration needs (or to determine whether those needs have been satisfied). He is familiar with the development and use of habitat suitability indices (HSIs) and with various assessment models, including habitat evaluation procedures (HEPs) for riparian and wetland habitats, the Hydrogeomorphic Approach, the Wetland Evaluation Technique, and other assessment methods. He was trained in HEP from its inception, has worked with the team that developed some of the HSIs, and is familiar with the concepts and application of the Index of Biotic Integrity and Floristic Quality Assessment. He also has taught some of these methods and was contracted by the State of Washington Department of Ecology to teach the State Wetland Rating System. In addition, he contributed to the development of the USACE Wetland Delineation Manual and supported efforts to develop and standardize the evaluation of wetlands and related habitat. He also has familiarity with essential fish habitat procedures.

Mr. Newling has more than 13 years of experience working for the USACE New England Division Regulatory Branch and the U.S. Army Engineer Waterways Experiment Station Environmental

³ Newling, C. J. 1975. Preliminary report on the floodplain animals of the Upper Mississippi River and the Illinois Waterway including some probable impacts of increased commercial traffic. U.S. Army Engineer District, St. Louis. 214 pp.

Newling, C. J. 1975. Threatened vertebrate species occurring or believed to occur in the floodplains of the Mississippi River between Cairo, Illinois, and Minneapolis, Minnesota, and the Illinois Waterway between Grafton, Illinois, and Chicago, Illinois. U.S. Army Engineer District, St. Louis. 131 pp.

Laboratory. His USACE work involved the evaluation and long-term monitoring of habitat development projects. From 1981 to 1989, he was the technical coordinator for USACE wetland training, including the evaluation of wetland functions and values, and he has organized, conducted, and served as primary instructor in hundreds of wetland-related training courses. He has provided rapid response assistance to USACE District offices nationwide on technical matters of wetland delineation, restoration, and regulation. His consulting expertise has focused on wetland delineation, wetland construction and restoration, the assessment of wetland functions and values, mitigation monitoring, and wetland mitigation banking. He is familiar with regulating works of various kinds, notably revetments and wing dams, and environmental issues involving their construction and maintenance.

He also has gained knowledge of USACE documentation associated with flood risk management while working on several recent projects serving on IEPR panels for USACE projects in Illinois, Wisconsin, Iowa, Missouri, Kansas, and Ohio.

Mr. Newling is a member of the Society of Wetland Scientists, The Wildlife Society, the Association of State Wetland Managers, the Society of Ecological Restoration, and the Wisconsin Wetlands Association, has served on the Board of Directors for the Society of Wetland Scientists as Liaison to its National Certification Program, and serves on the Board of Directors of the G.M. Sutton Avian Research Center. He is a Professional Wetland Scientist, Certified Wildlife Biologist, and Certified Wetland Delineator.

Peter Fischer, P.E.

Role: River Engineering

Affiliation: SEH

Mr. Fischer is a senior water resource engineer with 60 years of experience practicing in the fields of civil and water resources engineering, including river engineering experience on navigable waterways. He was a registered P.E. in Minnesota, North Dakota, Wisconsin and Iowa and received his B.S. and M.S. degrees from the University of Minnesota-Minneapolis. For more than 31 of those years, Mr. Fischer was with the USACE St. Paul District. His assignments included engineering management, project management, technical supervision, hydraulic design, and hydrologic engineering of a wide variety of projects in flood control, navigation, and water resources development. His work also included field inspections and reporting of dams, embankments, levees, rivers and channels.

To support his river engineering and river training structure expertise, Mr. Fischer has worked on and managed hydraulic navigation channel design for more than 10 years on projects along the Mississippi River and tributaries, and has been involved with projects that required the design of wing dams, rock dikes, riprap bank protection where the navigation channel was eroding its banks, diversion dikes, channel closure structures, gated inlet structures, groynes, gated diversion structures, weirs, revetments, and dredging and low overflow spillways. He has worked on several studies and rehabilitation projects on the Mississippi River and its tributaries, including the Mississippi River Locks and Dams 1 to 10 Rehabilitation projects, and projects to repair erosion downstream from Mississippi River Locks and Dams. He prepared hydraulic studies for the extension of the Mississippi River Navigation channel upstream from Lock and Dam 1 concentrating on the location of dredged material disposal areas to limit channel velocities to navigable rates.

Mr. Fischer has a thorough understanding of the physical effect of river training structures on river bathymetry, velocities, and water surfaces; river data collection; and river geomorphology. This is demonstrated by his work on navigation channels on the Mississippi, Minnesota, St. Croix, and Red River of the North. In addition, he directed and reviewed Emergency Action Plans for Baldhill Dam, Orwell Dam, 6 Mississippi River headwater reservoirs, and 10 locks and dams on the Mississippi River. The plans were developed using USACE criteria and federal guidelines for dam safety. Plans included emergency actions at the dam site, notification and evacuation procedures for downstream residents and inundation, depth, and velocity maps of the downstream flooded areas. Analysis included dam break analysis and flood wave routing.

Mr. Fischer also has a thorough understanding of both physical and multi-dimensional numeric hydraulic modeling. At Mississippi River Lock and Dam 3, he participated in the physical hydraulic modeling of the lock approach to eliminate severe out-draft. This model served as the basis for the multi-dimensional numeric hydraulic model. As part of the Upper St. Anthony Falls Locks and Navigation Pool (Minneapolis, Minnesota), he served as hydraulic engineer on the design of main overflow weirs, channel, and upper lock approach. He assisted with physical modeling of lock filling and emptying systems. As part of the Minnesota River Navigation Channel – Hennepin, Carver, Scott and Dakota Counties (Minnesota), he served as the hydraulic engineer and study director on the hydraulic studies for a 32-mile extension of the 9-foot channel.

For the past 25 years, as a member of SEH's Water Resources Division Mr. Fischer has been involved in the hands-on design of water resources projects. His work has included preparing concept and preliminary designs, providing hydraulic and hydrologic engineering advice to project designers, providing peer and quality review of hydrology and hydraulic modeling, and design reports, and preparing and coordinating the preparation of design and environmental reports. He has recently participated in independent reviews of design and feasibility reports for levees, canals and other water control facilities for USACE. He served as a member of an IEPR team for two projects within the New Orleans Hurricane and Storm Damage Risk Reduction System. Mr. Fischer is an active member of the American Society of Civil Engineers; the U.S. Committee on Large Dams; and the U.S. Committee on Irrigation, Drainage and Flood Control.

APPENDIX C

Final Charge to the IEPR Panel as Submitted to USACE on September 8, 2016 for the MMR Regulating Works SEIS Project

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Charge Questions and Guidance to the Panel Members for the IEPR of the Supplemental Environmental Impact Statement (SEIS) for the Mississippi River between the Ohio and Missouri Rivers (Regulating Works)

BACKGROUND

The St. Louis District (District) of the U.S. Army Corps of Engineers (USACE) is charged with operating and maintaining a navigation channel on the Middle Mississippi River (MMR) that is 9 feet deep and 300 feet wide with additional width in bends as necessary. The MMR is defined as that portion of the Mississippi River that lies between its confluence with the Ohio and the Missouri Rivers. This ongoing project is also commonly referred to as the Regulating Works Project. As authorized by Congress, the Regulating Works Project utilizes bank stabilization, rock removal, and sediment management to maintain bank stability and ensure adequate navigation depth and width. Bank stabilization is achieved by revetment and river training structures, while sediment management is achieved by river training structures. The Regulating Works Project is maintained through dredging and any needed maintenance to existing structural features. The long-term goal of the project, as authorized by Congress, is to obtain and maintain a navigation channel and reduce Federal expenditures by alleviating the amount of annual maintenance dredging through the construction of regulating works. Therefore, pursuant to this authorization, the District continually identifies and monitors areas of the MMR that require frequent and costly dredging to determine if a long-term sustainable solution through regulating works is reasonable. The District also monitors bank stabilization areas to determine if additional work or re-enforcement of existing work is needed to ensure the dependability of the navigation channel.

The environmental impacts of the Regulating Works Project were originally documented in the 1976 Environmental Impact Statement (1976 EIS) Mississippi River between the Ohio and Missouri Rivers (Regulating Works). The 1976 EIS was recently reviewed by the District and by the USACE Planning Center of Expertise for Inland Navigation (PCXIN) to determine whether the document should be supplemented. The District and the PCXIN concluded that, although the Project had not changed substantially, there were significant new circumstances and information relevant to the Regulating Works Project and its potential impacts that warranted consideration of a supplement. The significant new circumstances and information on the potential impacts of the Regulating Works Project include the following:

- New Federally threatened and endangered species have been listed since preparation of the 1976 EIS.
- The District has implemented new programs to restore fish and wildlife habitat on the MMR.
- New information exists on the changes in average river planform width in response to river training structure placement.
- New information exists on the impacts of river training structures on water surface elevations.
- New information exists on the impacts of river training structures and dredging on fish and macroinvertebrates.

- New information exists on the effects of navigation on fish and wildlife resources.
- New information exists on the status of MMR side channels.

Congress provided the manner in which the navigation channel for the MMR should be obtained and maintained via the original Regulating Works Project authorization in 1910 and a modification to the authorization in 1927. The purpose of the Supplemental Environmental Impact Statement (SEIS) is not to consider a change to that authorization through re-evaluating the need for the Regulating Works Project or the methods to be used to accomplish the goals of the project. Rather, the SEIS analyzes the impacts of the Regulating Works Project as it is currently constructed, operated, and maintained with current information that has become available since the completion of the 1976 EIS and with information from recent analyses the District conducted to address data gaps relevant to potential impacts.



Figure 1. The Middle Mississippi River (MMR)

OBJECTIVES

The objective of this work is to conduct an independent external peer review (IEPR) of the SEIS for the Mississippi River between the Ohio and Missouri Rivers (Regulating Works) (hereinafter: MMR Regulating Works SEIS IEPR) in accordance with the Department of the Army, U.S. Army Corps of Engineers (USACE), Water Resources Policies and Authorities' *Civil Works Review* (Engineer Circular [EC] 1165-2-214, dated December 15, 2012), and the Office of Management and Budget'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, engineering, and environmental methods, models, and analyses used” (EC 1165-2-214; p. D-4) for the MMR Regulating Works SEIS 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) with extensive experience in river engineering, Civil Works planning/economics, and biological resources and environmental law compliance issues relevant to the project. They will also have experience applying their subject matter expertise to inland navigation.

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 1165-2-214, Appendix D, 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.

Documents for Review

The following documents are to be reviewed by designated discipline:

Review Documents	No. of Review Pages	Subcontractor Disciplines		
		Civil Works Planning/Economics	Bio. Resources and Environmental Law Compliance	River Engineer
Regulating Works Project, Draft SEIS	241	241	241	241
Appendix A: Effects of River Training Structures on Flood Levels	30	30	30	30
Appendix B: Biological Assessment	11		11	
Appendix C: Habitat Loss, Mitigation Needs, and Adaptive Management	23		23	
Appendix D: Section 404(b)(1) Evaluation	36		36	
Appendix F: Determination of National Register Eligibility	59	59	59	
Appendix F: Supplement	18	18	18	18
Total number of pages to be reviewed	418	348	418	289
Supplemental Information				
Public Comments	100	100	100	100
1976 Regulating Works EIS	602	602	602	602
Total number of pages provided for reference	702	702	702	702

Documents for Reference

- USACE guidance *Civil Works Review*, (EC 1165-2-214, December 15, 2012)
- Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* (December 16, 2004)
- USACE Climate Change Adaptation Plan (June 2014)

SCHEDULE

This schedule is based on the August 25, 2016, receipt of the final review documents. Note that dates presented in the schedule below could change due to panel member and USACE availability.

Task	Action	Due Date
SEIS - Review	Battelle sends review documents to panel members	9/12/2016
	Battelle convenes kick-off meeting with panel members	9/13/2016
	Battelle convenes kick-off meeting with USACE and panel members	9/13/2016
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	9/20/2016
	Panel members complete their individual reviews	9/27/2016
SEIS - Final Panel Comments	Battelle provides talking points for Panel Review Teleconference to panel members	9/28/2016
	Battelle convenes Panel Review Teleconference	9/29/2016
	Battelle provides Final Panel Comment templates and instructions to panel members	9/30/2016
	Panel members provide draft Final Panel Comments to Battelle	10/4/2016
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	10/5-10/10/2016
	Panel finalizes Final Panel Comments	10/11/2016
SEIS - Final IEPR Report	Battelle provides Final IEPR Report to panel members for review	10/12/2016
	Panel members provide comments on Final IEPR Report	10/13/2016
	*Battelle submits Final IEPR Report to USACE	10/13/2016
	USACE Planning Center of Expertise (PCX) provides decision on Final IEPR Report acceptance	10/21/2016
SEIS - Comment/Response Process	Battelle inputs Final Panel Comments to Design Review and Checking System (DrChecks) and provides Final Panel Comment response template to USACE	10/25/2016
	Battelle convenes teleconference with Panel to review the Comment Response Process	10/25/2016
	USACE Project Delivery Team (PDT) provides draft Evaluator Responses to USACE PCX for review	11/8/2016
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	11/15/2016
	USACE PCX provides draft PDT Evaluator Responses to Battelle	11/16/2016
	Battelle provides draft PDT Evaluator Responses to panel members	11/18/2016
	Panel members provide draft BackCheck Responses to Battelle	11/23/2016
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	11/28/2016
	Battelle convenes Comment-Response Teleconference with panel members and USACE	11/29/2016

Task	Action	Due Date
SEIS - Comment/Response Process	USACE inputs final PDT Evaluator Responses to DrChecks	12/6/2016
	Battelle provides final PDT Evaluator Responses to panel members	12/8/2016
	Panel members provide final BackCheck Responses to Battelle	12/13/2016
	Battelle inputs panel members' final BackCheck Responses to DrChecks	12/20/2016
	*Battelle submits pdf printout of DrChecks project file	12/21/2016
Public Comments – Review and Final Panel Comments	Battelle receives the public comments from USACE	12/22/2016
	Battelle sends public comments to Panel	12/22/2016
	Panel completes its review of public comments	12/29/2016
	Battelle and Panel review Panel's responses to public comments	12/30/2016
	Panel drafts Final Panel Comment for public comments, if necessary	1/3/2017
Public Comments - Addendum	*Panel finalizes Final Panel Comment regarding public comments and submits Addendum to the Final IEPR Report	1/9/2017
Public Comments - Comment Response Process	Battelle inputs Final Panel Comments to DrChecks and provides Final Panel Comment response template to USACE	1/19/2017
	USACE PDT provides draft Evaluator Responses to USACE PCX for review	1/26/2017
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	1/30/2017
	USACE PCX provides draft PDT Evaluator Responses to Battelle	1/31/2017
	Battelle provides draft PDT Evaluator Responses to panel members	2/1/2017
	Panel members provide draft BackCheck Responses to Battelle	2/3/2017
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	2/6/2017
	Battelle convenes Comment-Response Teleconference with panel members and USACE	2/7/2017
	USACE inputs final PDT Evaluator Responses to DrChecks	2/9/2017
	Battelle provides final PDT Evaluator Responses to panel members	2/9/2017
	Panel members provide final BackCheck Responses to Battelle	2/13/2017
	Battelle inputs panel members' final BackCheck Responses to DrChecks	2/14/2017
	*Battelle submits pdf printout of DrChecks project file	2/15/2017

* Deliverables

CHARGE FOR PEER REVIEW

Members of this IEPR Panel are asked to determine whether the technical approach and scientific rationale presented in the MMR Regulating Works SEIS 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 MMR Regulating Works SEIS documents. Please focus your review on the review materials assigned to your discipline/area of expertise and technical knowledge. Even though there are some sections with no questions associated with them, that does not mean that you cannot 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 the following guidance. Note that the Panel will be asked to provide an overall statement related to 2 and 3 below per USACE guidance (EC 1165-2-214; Appendix D).

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 (Lynn McLeod, mcleod@battelle.org) or Program Manager (Rachel Sell; sellr@battelle.org) for requests or additional information.
3. In case of media contact, notify the Battelle Program Manager, Rachel Sell (sellr@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 Rachel Sell, sellr@battelle.org, no later than September 27, 2016, 10 pm ET.

Independent External Peer Review

of the

Supplemental Environmental Impact Statement (SEIS) for the Mississippi River between the Ohio and Missouri Rivers (Regulating Works)

Charge Questions and Relevant Sections as Supplied by USACE

1. Are the need for and purpose of the Regulating Works project adequately defined?
2. Are the need for and purpose of the Supplemental Environmental Impact Statement clearly described?
3. Have public concerns been identified and adequately addressed?
4. Has adequate stakeholder and agency involvement been discussed to identify issues of interest and to solicit feedback from interested parties?
5. Are there any relevant issues, resources, or concerns that have not been identified and/or addressed?
6. Are the alternatives clearly described?
7. Are the resources in the Project Area accurately and adequately described?
8. Is the discussion of resources sufficient to characterize current baseline conditions and to allow for evaluation of forecasted conditions?
9. Are the environmental and engineering methodologies, analyses, and projections used to assess impacts consistent with generally accepted methodologies?
10. Are the environmental and engineering assumptions that underlie the impact analyses adequate?
11. Are the interpretations and conclusions reached as a result of the impact analyses reasonable?
12. Are the anticipated direct and indirect impacts to affected resources adequately addressed?
13. Are the anticipated cumulative impacts to affected resources adequately addressed and/or adequately incorporated by reference?
14. Are the anticipated impacts to/of climate change adequately addressed?
15. Are the expected changes in the quality and abundance of ecological resources adequately described in justifying compensatory mitigation?
16. Is the need to address compensatory mitigation planning in site-specific Environmental Assessments adequately described?

17. Overall, does the SEIS clearly and adequately describe the scope (extent and magnitude) of direct, indirect, and cumulative environmental impacts of the alternatives in an effective manner for consideration by the general public and agency leaders?
18. Does the document satisfy the requirements of the National Environmental Policy Act, Clean Water Act, Endangered Species Act, Fish and Wildlife Coordination Act, National Historic Preservation Act, and other applicable laws, regulations, policies, and guidance?
19. Are the likely areas of controversy adequately addressed?

Battelle Summary Charge Questions to the Panel Members⁴

Summary Questions

20. 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.
21. Please provide positive feedback on the project and/or review documents.

Public Comment Questions

22. Does information or do concerns raised by the public raise any additional discipline-specific technical concerns with regard to the overall report?

⁴ Questions 20 through 22 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 on September 8, 2016.

APPENDIX D

Conflict of Interest Form

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Conflicts of Interest Questionnaire **Independent External Peer Review**

Supplemental Environmental Impact Statement for the Mississippi River between the Ohio and Missouri Rivers

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**
REPRESENTATIVE'S NAME: **Courtney M. Brooks**
TELEPHONE: **614-424-5623**
ADDRESS: **505 King Avenue, Columbus, OH 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 M. Brooks

August 17, 2016

