

# Final Independent External Peer Review Report Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington



Prepared by  
Battelle Memorial Institute

Prepared for  
Department of the Army  
U.S. Army Corps of Engineers  
Deep Draft Navigation Planning Center of Expertise  
Mobile District

Contract No. W912HQ-15-D-0001  
Task Order: 0012

September 23, 2016

This page is intentionally left blank.

CONTRACT NO. W912HQ-15-D-0001  
Task Order: 0012

# Final Independent External Peer Review Report Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington

Prepared by

Battelle  
505 King Avenue  
Columbus, Ohio 43201

for

Department of the Army  
U.S. Army Corps of Engineers  
Deep Draft Navigation Planning Center of Expertise  
Mobile District

September 23, 2016

This page is intentionally left blank.

# Final Independent External Peer Review Report Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington

## Executive Summary

### PROJECT BACKGROUND AND PURPOSE

The Seattle Harbor, Washington, Navigation Improvement Project is a single-purpose deep draft navigation project located in King County, Washington. The Federally authorized East and West Waterways are located in Puget Sound's Elliott Bay at Seattle, Washington (Figure 1). The East Waterway has authorized depths from -34 to -51 feet mean lower low water (MLLW), and the West Waterway has an authorized depth of -34 feet MLLW. The Seattle Harbor study is evaluating the feasibility of deepening the channels to a depth of up to -57 feet MLLW.



Figure 1. Seattle Harbor Navigation Improvement Project Area

The purpose of the proposed Federal action is to achieve transportation cost savings (increased economic efficiencies) at the East and West Waterways of Seattle Harbor. Navigational challenges have been identified in both the East and West Waterways of Seattle Harbor, and authorized depths do not meet the draft requirements of today's fleet of larger container ships. Tide restrictions, light loading, or

other operational inefficiencies created by inadequate channel depth result in economic inefficiencies that translate into costs for the national economy.

Planning objectives for the study are as follows:

- Achieve transportation cost savings to and from Seattle Harbor to the extent possible over the 50-year period of analysis.
- Develop an alternative that is environmentally sustainable for the 50-year period of analysis.
- Reduce navigation challenges facing harbor pilots and their operating practices for the 50-year period of analysis.

## Independent External Peer Review Process

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. U.S. Army Corps of Engineers (USACE) is conducting an Independent External Peer Review (IEPR) of the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment (FR/EA), King County, Washington (hereinafter: Seattle Harbor 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 Seattle Harbor, Washington, Navigation Improvement Project FR/EA. 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 Seattle Harbor review documents and the overall scope of the project, Battelle identified potential candidates for the Panel in the following key technical areas: economics, environmental compliance, and coastal/hydraulic 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 Seattle Harbor IEPR review documents (513 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 (2004), 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 Seattle Harbor 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, seven Final Panel Comments were identified and documented. Of these, one was identified as having medium/high significance, five had a medium significance, and one had low significance.

Battelle received public comments from USACE on the Seattle Harbor FR/EA (approximately 13 written comments and one transcript for a total of 21 pages of comments) and provided them to the IEPR panel members. The panel members were charged with determining if any information or concerns presented in the public comments raised any additional discipline-specific technical concerns with regard to the Seattle Harbor review documents. After completing its review, the Panel confirmed that no new issues or concerns were identified. However, the Panel noted that some of the issues raised in the public comments were similar to concerns raised in the IEPR Final Panel Comments, particularly the channel width versus berthing areas in each waterway.

## 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 Seattle Harbor review documents. Table ES-1 lists the Final Panel Comment statements by level of significance. The full text of the Final Panel Comments is presented in Section 4.2 of this report. The following summarizes the Panel’s findings.

Based on the Panel’s review, the report is well-written, concise, and provides excellent supporting documentation on engineering and environmental issues. The report provided a balanced assessment of the economic, engineering, and environmental issues of the Seattle Harbor project, however, the Panel identified several elements of the report that should be clarified or revised.

**Economics:** The Panel has reviewed the methods and models used to conduct the benefit/cost analysis for Seattle Harbor. While the FR/EA used correct models and methods, information needs to be clarified or added, and the accuracy of some of the evaluation data needs to be verified. Key evaluation data, such as vessel operating costs by class and a forecast for non-containership vessels, are not presented in the FR/EA. These operating costs are a significant input to the HarborSym benefit evaluation model, but are not presented in the FR/EA. Information such as how many non-containership vessels will also pass through the area is necessary to determine whether these vessels will cause delays or impact container throughput.

Currently, information on commodity growth rates and channel depth are not sufficiently discussed or supported by enough data. The information on traffic growth and import growth rates does not explain how significant growth will occur in the future in light of the declines the Port has experienced in commodity tonnage and 20-foot equivalent units (TEUs) between 2011 and 2014 and from competing ports increasing in the area. Additional details on channel depth optimization, specifically the need for a -56-foot deep channel to attain maximum loading of vessels, would eliminate the uncertainty regarding the need for greater channel depths and associated costs. The Panel suggests that the FR/EA clarify how USACE determined the need for a -56-foot deep Federal channel, given the design vessel used and the tidal advantages.

The data reported in several of the Economic Appendix tables on commodity forecasts, benefits, and vessel calls associated with the Asia Route Group and the Mediterranean Route Group appear to be inconsistent. Verifying, and potentially correcting, the number of calls, TEUs, and benefits relative to the total cargo amounts for these route groups would help address this issue.

**Environmental:** The Panel agrees with the conservative approach taken to deal with the uncertainties and risks associated with the delayed removal and uncertain quantities of hazardous, toxic, and radioactive waste (HTRW) materials and the potential impacts on the project schedule. Overall, the Panel believes the FR/EA is an ideal example of what environmental documentation and analysis should look like in a decision document. The only environmental issue the Panel believes could be strengthened is the analysis of noise impacts on marine mammals for the with-project condition. The document currently states there will be a decrease in noise due to a decrease in vessel trips; however, the possibility of increased noise due to larger vessels with larger turbines and thrusters, as well as the potential need for larger or additional tugs to assist these vessels, has not been considered.

**Engineering:** The engineering aspects of the project were straightforward and clear, and the appropriate methods were applied. The Panel suggests that the FR/EA clarify why the Tentatively Selected Plan (TSP) includes Federal channel widths that are more conservative than the guidelines provided in USACE EM 1110-2-1613 and the minimum requirements established by the Puget Sound Pilots (2015) for tugboat assistance. It is also unclear how the 550-foot-wide Federal navigation channel can remain open to vessel traffic when two Generation IV vessels (185 feet wide) are berthed on opposite sides of the 750-foot-wide waterway.

**Table ES-1. Overview of Seven Final Panel Comments Identified by the Seattle Harbor IEPR Panel**

No.	Final Panel Comment
<b>Significance – Medium/High</b>	
1	Key evaluation data, such as vessel operating costs by class and a forecast for non-containership vessels, are not presented in the FR/EA.
<b>Significance – Medium</b>	
2	The FR/EA does not make a convincing case in the commodity forecast for the substantial traffic growth rates for import and export containerized goods.
3	The FR/EA does not present sufficient information on why vessels with design drafts up to -52.6 feet need a -56-foot-deep channel to attain their maximum loading capabilities, given the substantial tidal advantage at Seattle Harbor.
4	Information in the Economic Appendix on commodity forecasts, benefits, and number of vessel calls by route group appears to be inconsistent.
5	It is not clear why the TSP includes Federal channel widths that are more conservative than the guidelines provided in USACE EM 1110-2-1613 and the minimum requirements established by the Puget Sound Pilots (2015) for tugboat assistance.
6	It is not clear how the cost-shared General Navigation Feature (550-foot-wide channel) can remain open when two Generation IV vessels are berthed on opposite sides of the 750-foot-wide waterway.
<b>Significance – Low</b>	
7	The qualitative underwater noise impact analysis for the with-project condition does not consider the possibility of increased noise levels from the projected use of larger vessels, due to the use of larger positioning thrusters and propulsion units, and the potential need for larger or more numerous tending vessels necessary to safely maneuver them.

This page is intentionally left blank.

# Table of Contents

	Page
Executive Summary .....	iii
1. INTRODUCTION.....	1
2. PURPOSE OF THE IEPR.....	2
3. METHODS FOR CONDUCTING THE IEPR .....	2
4. RESULTS OF THE IEPR.....	4
4.1 Summary of Final Panel Comments .....	4
4.2 Final Panel Comments .....	5
5. REFERENCES.....	14
Appendix A. IEPR Process for the Seattle Harbor Project	
Appendix B. Identification and Selection of IEPR Panel Members for the Seattle Harbor Project	
Appendix C. Final Charge to the IEPR Panel as Submitted to USACE on August 5, 2016, for the Seattle Harbor Project	
Appendix D. Conflict of Interest Form	

## List of Tables

	Page
Table ES-1. Overview of Seven Final Panel Comments Identified by the Seattle Harbor IEPR Panel....	vii
Table 1. Major Milestones and Deliverables of the Seattle Harbor IEPR .....	3

## List of Figures

Figure 1. Seattle Harbor Navigation Improvement Project Area.....	1
---	---

## LIST OF ACRONYMS

<b>ADM</b>	Agency Decision Milestone
<b>ATR</b>	Agency Technical Review
<b>COI</b>	Conflict of Interest
<b>CWRB</b>	Civil Works Review Board
<b>DrChecks</b>	Design Review and Checking System
<b>EA</b>	Environmental Assessment
<b>EC</b>	Engineer Circular
<b>EM</b>	Engineer Manual
<b>EP</b>	Engineer Pamphlet
<b>ER</b>	Engineer Regulation
<b>ERDC</b>	Engineer Research and Development Center
<b>FR</b>	Feasibility Report
<b>GNF</b>	General Navigation Feature
<b>HTRW</b>	Hazardous, toxic, and radioactive waste
<b>IEPR</b>	Independent External Peer Review
<b>IWR</b>	Institute for Water Resources
<b>LPP</b>	Locally Preferred Plan
<b>LSF</b>	Local service facility
<b>MLLW</b>	Mean lower low water
<b>NEPA</b>	National Environmental Policy Act
<b>NTP</b>	Notice to Proceed
<b>OEO</b>	Outside Eligible Organization
<b>OMB</b>	Office of Management and Budget
<b>PDT</b>	Project Delivery Team
<b>TEU</b>	Twenty-foot equivalent units
<b>TSP</b>	Tentatively Selected Plan
<b>USACE</b>	United States Army Corps of Engineers

## 1. INTRODUCTION

The Seattle Harbor, Washington, Navigation Improvement Project is a single-purpose deep draft navigation project located in King County, Washington. The Federally authorized East and West Waterways are located in Puget Sound's Elliott Bay at Seattle, Washington (Figure 1). The East Waterway has authorized depths from -34 to -51 feet mean lower low water (MLLW), and the West Waterway has an authorized depth of -34 feet MLLW. The Seattle Harbor study is evaluating the feasibility of deepening the channels to a depth of up to -57 feet MLLW.



Figure 1. Seattle Harbor Navigation Improvement Project Area

The purpose of the proposed Federal action is to achieve transportation cost savings (increased economic efficiencies) at the East and West Waterways of Seattle Harbor. Navigational challenges have been identified in both the East and West Waterways of Seattle Harbor, and authorized depths do not meet the draft requirements of today's fleet of larger container ships. Tide restrictions, light loading, or other operational inefficiencies created by inadequate channel depth result in economic inefficiencies that translate into costs for the national economy.

Planning objectives for the study are as follows:

- Achieve transportation cost savings to and from Seattle Harbor to the extent possible over the 50-year period of analysis.
- Develop an alternative that is environmentally sustainable for the 50-year period of analysis.
- Reduce navigation challenges facing harbor pilots and their operating practices for the 50-year period of analysis.

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 Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment (FR/EA), King County, Washington (hereinafter: Seattle Harbor IEPR) in accordance with procedures described in the Department of the Army, U.S. Army Corps of Engineers (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, and environmental analyses contained in the Seattle Harbor 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 August 5, 2016. Appendix D presents the organizational conflict of interest form that Battelle completed and submitted to the Institute for Water Resources (IWR) prior to the award of the Seattle Harbor 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, and environmental 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 Seattle Harbor, Washington, Navigation Improvement Project FR/EA 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 Seattle Harbor IEPR. Due dates for milestones and deliverables are based on the award/effective date of July 20, 2016. Note that the work items listed under Task 6 occur after the submission of this report. Battelle anticipates submitting the pdf printout of the USACE's Design Review and Checking System (DrChecks) project file (the final deliverable) on November 23, 2016. The actual date for contract end will depend on the date that all activities for this IEPR, including Agency Decision Meeting (ADM) and Civil Works Review Board (CWRB) preparation and participation, are conducted.

**Table 1. Major Milestones and Deliverables of the Seattle Harbor IEPR**

Task	Action	Due Date
1	Award/Effective Date	7/20/2016
	Review documents available	7/29/2016
2	Battelle submits list of selected panel members	7/28/2016
	USACE confirms the panel members have no COI	7/29/2016
3	Battelle convenes kick-off meeting with USACE	7/28/2016
	Battelle convenes kick-off meeting with USACE and panel members	8/8/2016
4	Panel members complete their individual reviews	8/25/2016
	Panel members provide draft Final Panel Comments to Battelle	9/9/2016
	Battelle sends public comments to Panel	9/6/2016
	Panel completes its review of public comments	9/14/2016
5	Battelle submits Final IEPR Report to USACE	9/23/2016
6 <sup>a</sup>	Battelle convenes Comment-Response Teleconference with panel members and USACE	11/7/2016
	Battelle submits pdf printout of DrChecks project file to USACE	11/23/2016
	ADM <sup>b</sup>	11/4/2016
	CWRB Meeting (Estimated Date) <sup>b</sup>	June 2017
	Contract End/Delivery Date	11/30/2017

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

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

Battelle identified, screened, and selected three panel members to participate in the IEPR based on their expertise in the following disciplines: economics, environmental compliance, and coastal/hydraulic engineering. The Panel reviewed the Seattle Harbor document and produced seven Final Panel Comments in response to 17 charge questions provided by USACE for the review. This charge included two overview questions and one public comment-related 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 Seattle Harbor IEPR review document. The following summarizes the Panel's findings.

Based on the Panel's review, the report is well-written, concise, and provides excellent supporting documentation on engineering and environmental issues. The report provided a balanced assessment of the economic, engineering, and environmental issues of the Seattle Harbor project, however, the Panel identified several elements of the report that should be clarified or revised.

**Economics:** The Panel has reviewed the methods and models used to conduct the benefit/cost analysis for Seattle Harbor. While the FR/EA used correct models and methods, information needs to be clarified or added, and the accuracy of some of the evaluation data needs to be verified. Key evaluation data, such as vessel operating costs by class and a forecast for non-containership vessels, are not presented in the FR/EA. These operating costs are a significant input to the HarborSym benefit evaluation model, but are not presented in the FR/EA. Information such as how many non-containership vessels will also pass through the area is necessary to determine whether these vessels will cause delays or impact container throughput.

Currently, information on commodity growth rates and channel depth are not sufficiently discussed or supported by enough data. The information on traffic growth and import growth rates does not explain how significant growth will occur in the future in light of the declines the Port has experienced in commodity tonnage and 20-foot equivalent units (TEUs) between 2011 and 2014 and from competing ports increasing in the area. Additional details on channel depth optimization, specifically the need for a -56-foot deep channel to attain maximum loading of vessels, would eliminate the uncertainty regarding the need for greater channel depths and associated costs. The Panel suggests that the FR/EA clarify how USACE determined the need for a -56-foot deep Federal channel, given the design vessel used and the tidal advantages.

The data reported in several of the Economic Appendix tables on commodity forecasts, benefits, and vessel calls associated with the Asia Route Group and the Mediterranean Route Group appear to be inconsistent. Verifying, and potentially correcting, the number of calls, TEUs, and benefits relative to the total cargo amounts for these route groups would help address this issue.

**Environmental:** The Panel agrees with the conservative approach taken to deal with the uncertainties and risks associated with the delayed removal and uncertain quantities of hazardous, toxic, and radioactive waste (HTRW) materials and the potential impacts on the project schedule. Overall, the Panel believes the FR/EA is an ideal example of what environmental documentation and analysis should look like in a decision document. The only environmental issue the Panel believes could be strengthened is the analysis of noise impacts on marine mammals for the with-project condition. The document currently states there will be a decrease in noise due to a decrease in vessel trips; however, the possibility of increased noise due to larger vessels with larger turbines and thrusters, as well as the potential need for larger or additional tugs to assist these vessels, has not been considered.

**Engineering:** The engineering aspects of the project were straightforward and clear, and the appropriate methods were applied. The Panel suggests that the FR/EA clarify why the Tentatively Selected Plan (TSP) includes Federal channel widths that are more conservative than the guidelines provided in USACE EM 1110-2-1613 and the minimum requirements established by the Puget Sound Pilots (2015) for tugboat assistance. It is also unclear how the 550-foot-wide Federal navigation channel can remain open to vessel traffic when two Generation IV vessels (185 feet wide) are berthed on opposite sides of the 750-foot-wide waterway.

## 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

**Key evaluation data, such as vessel operating costs by class and a forecast for non-containership vessels, are not presented in the FR/EA.**

### Basis for Comment

Vessel operating costs are a significant input to the HarborSym benefit evaluation model, but they are not presented in the FR/EA. Without information on vessel operating costs, it is not possible to fully understand the derivation of benefits or the reasonableness of the results.

The Panel understands that some of the vessel cost information developed by government consultants may be proprietary. However, information on vessel costs by class and sailing draft is essential for reviewing and assessing the reasonableness of the economic benefits. In addition, some information on the relative economies of scale of the use of larger vessels at deeper drafts should be presented in the report to demonstrate how the benefits were derived. Without such information, the understanding of how the alternative plans accrue economic benefits without any increases in commodity shipments over the without-project condition may not be clear or may be subject to misinterpretation.

Most, if not all, non-containership traffic is upstream of the container docks. As such, it passes through the same channels and competes with containership vessels for available time to ingress and egress the channels for dock access. Information on the characteristics, types, and numbers of non-containership vessels will help determine whether such traffic impacts port capacity or causes delays.

### Significance – Medium/High

Economic benefits are dependent on vessel calls forecasted. If containership vessels cannot attain the number of forecasted trips because of other non-containership traffic, the benefit estimates and benefit/cost ratios will not be accurate. Benefits are likewise dependent upon vessel operating costs by class and sailing draft. Without such information, the FR/EA does not provide sufficient information to determine the reasonableness of the transportation cost savings.

### Recommendation for Resolution

1. Provide in the FR/EA comparative cost information by vessel class and channel depth in order to understand the derivation of benefits. Such information may, for example show how much transportation costs are reduced by eliminating one vessel call to Seattle.
2. Provide by representative vessel for each vessel class, by route group, the cost per 1000 miles per ton or laden TEU, for each sailing draft.
3. Present existing information on the characteristics, types, and volumes of non-containership traffic in the port channel areas, and present a general forecast of the volumes of traffic.
4. Explain how the non-containership traffic has been taken into account in the container throughput capacity of both the East and West waterways and whether this has been factored into the port capacity for container cargo and addressed in modeling of delays.

## Final Panel Comment 2

**The FR/EA does not make a convincing case in the commodity forecast for the substantial traffic growth rates for import and export containerized goods.**

### Basis for Comment

The commodity forecast is a significant factor in the economic analysis and should be convincingly supportable. The FR/EA notes that commodity tonnage and TEUs imported and exported through Seattle Harbor have declined from 2011 through 2014. During this time, competing ports, such as Port Rupert in Canada, have experienced increases in commodity tonnage and TEUs, particularly from imports. The FR/EA, however, predicts growth rates for the port of Seattle of 3 and 6 percent per year, including 5 percent import growth rates in the years following project implementation. It is not clear how and to what extent the commodity forecast has taken into account the competition for traffic from other, deeper ports. It is also not clear what data are being considered (quantitative) or what measures are being taken (qualitative) to account for the relatively high growth rates, given the recent declines in tonnage and TEUs imported and exported through Seattle Harbor.

Hanjin, a significant carrier of containerized freight for the Port of Seattle, recently filed for bankruptcy (The Seattle Times, September 1, 2016). While this is a very recent and perhaps unanticipated event, it could have an adverse effect on the future growth of traffic for the port.

### Significance – Medium

If commodity forecasts are not adequately explained or supported by enough data, the resulting benefits estimates and benefit/cost ratios cannot be considered reliable.

### Recommendation for Resolution

1. Present information in the report that more convincingly supports the growth rates in light of the recent declines and how other competing ports have been taken into account.
2. Address whether the Hanjin bankruptcy may affect commodity forecasts.

### Final Panel Comment 3

**The FR/EA does not present sufficient information on why vessels with design drafts up to -52.6 feet need a -56-foot-deep channel to attain their maximum loading capabilities, given the substantial tidal advantage at Seattle Harbor.**

#### Basis for Comment

Sailing draft distributions and hours of channel availability through tide have a substantial effect on vessel loadings and operations. Seattle Harbor has more tide than many major ports in the world. The evaluation presented in the FR/EA resulted in an assumption of 0.6 to 0.7 feet of additional sailing draft for every additional foot of channel depth. However, the evaluation may not have fully taken into account the substantial tidal advantage present at Seattle Harbor. In order to support this assumption, it is necessary to take into account differences in tidal advantage at various ports around the world, or document a policy decision that this is an appropriate assumption as currently presented.

The FR/EA does not provide any information on with-project condition tides and how many hours the channel is available for vessels to transit at various depths. Nor does it provide sufficient information on why such deep channel depths are needed to attain maximum loading of vessels. At the request of the IEPR Panel, USACE provided additional information to Battelle to distribute to the Panel that included project channel depths for a -57-foot with-project channel, which showed that vessels could transit Seattle Harbor at depths of -53 feet for 23 hours per day, and that -50 feet of sailing draft is available 24 hours per day.

The largest design vessel used in the analysis has a design draft of -52.6 feet and a maximum sailing draft of -51.7 feet when loaded. The data provided by USACE assume that -51.7 feet of draft can be attained 22 to 23 hours per day. While the tidal availability of a -56-ft channel has not been shown, channel depths below -57 feet would also provide a substantial number of hours per day for maximum sailing draft. An assumption of close to 1 foot of sailing draft shift for each foot of additional sailing draft may well result in maximization of benefits at a channel depth less than -56 feet.

#### Significance – Medium

The FR/EA does not provide sufficient information on why such deep channel depths are needed to attain maximum loading of vessels.

#### Recommendation for Resolution

1. Provide documentation on why vessels drawing up to -51.7 feet need a -56-foot-deep channel to attain this sailing draft, given the substantial tidal advantage at Seattle Harbor.
2. Clarify assumptions of the tidal advantages considered.
3. Conduct a sensitivity analysis using a sailing draft distribution shift of 0.9 to 1.0 feet for every additional foot of channel depth.

#### Final Panel Comment 4

**Information in the Economic Appendix on commodity forecasts, benefits, and number of vessel calls by route group appears to be inconsistent.**

#### Basis for Comment

Table 3-16 (p. 53) of the Economic Appendix shows that, of the total number of TEUs forecasted for Seattle Harbor, approximately 88% are on the Asia Route Group and about 12% are on the Mediterranean Route Group. However, Table 4-10 (p. 85) shows that, of the total number of vessel calls, the number on the Asia Route Group is only about 12% (77 vessel calls for 2024) and the number on the Mediterranean Route Group is about 88% (447 vessel calls). Based on the information provided, it is unclear how 12% of the vessel calls can carry 88% of the TEUs.

As currently presented, the vessels on the Asia Route Group would have to carry TEUs exceeding their carrying capacity (12,667 TEUs per vessel call). However, if the Asia Route Group had 88% of the vessel calls (e.g., the number currently associated with the Mediterranean Route Group in Table 4-10), then each vessel call would have 2,182 TEUs per call. Given this correlation, the Panel believes that some type of transposition of numbers may have occurred in one or more of these tables.

In addition, based on the numbers in Tables 3-16 and 4-10, Tables 4-22 and 23 (p. 96) show savings for the Asia Route Group to be only about 10% of the total savings and for the Mediterranean Route Group about 90%.

Considering the small amount of cargo associated with the Mediterranean Route Group relative to the Asia Route Group, it is very difficult to understand the need for the number of vessel calls and the overwhelming transportation cost savings associated with the Mediterranean route. Furthermore, the benefits claimed for the separate routes cannot be verified with the information as presented.

#### Significance – Medium

If vessel calls and commodity forecasts are not adequately documented and explained, the resulting benefits estimates and benefit/cost ratios cannot be considered reliable.

#### Recommendation for Resolution

1. Verify, and if necessary correct, the number of calls, TEUs, and benefits relative to the total cargo amounts for the Asia Route Group and the Mediterranean Route Group.
2. If the data presented in Tables 3-16, 4-10, and 4-22 are determined to be correct as currently presented, provide an explanation of how these results were calculated.
3. Review the FR/EA and the Economics Appendix for numbers quoted or associated with these tables to ensure accurate data are being presented throughout the documents.

**Final Panel Comment 5**

**It is not clear why the Tentatively Selected Plan (TSP) includes Federal channel widths that are more conservative than the guidelines provided in USACE EM 1110-2-1613 and the minimum requirements established by the Puget Sound Pilots (2015) for tugboat assistance.**

**Basis for Comment**

USACE EM 1110-2-1613 suggests that channels may be as small as 2.0 times the beam. The general guidance on channel width (2 to 6 times the beam) is typically applied to situations where the vessel is unassisted (i.e., no tug assistance) and where slight currents may exist.

Puget Sound Pilots require at least 1 tugboat (and up to 3 tugboats, depending on vessel characteristics) to assist vessels within the East and West Waterways, as described in the Economics Appendix (Section 2.6.3 Sailing Practices, p. 32) and in Puget Sound Pilots (2015). In addition, Puget Sound Pilots require a horizontal clearance of at least 140 feet, meaning a minimum clearance of 70 feet on each side of the vessel when it is in the center of the waterway. Assuming a design vessel with a beam of 185 feet, a 325-foot channel would be required, at minimum. Thus, the recommended channel width of 3.0 times the beam seems overly conservative and may present an unnecessary cost to the project.

In addition, it is not clear at what point the tugs begin assisting the vessels (i.e., in Elliot Bay before the approach channel, or in the approach channel itself). Therefore, the 700-foot-wide outer channel may be overly conservative as well.

**Significance – Medium**

Without an understanding of how USACE arrived at the recommended channel width, it is not clear how the plan formulation process arrived at the set of alternative plans that were evaluated.

**Recommendation for Resolution**

1. Explain the conservative channel width of 3.0 times the design vessel beam, given the channel width guidance in USACE EM 1110-2-1623 and the Puget Sound Pilots' requirement to use tug assistance.
2. Provide information on the tug dispatch procedure (i.e., when do the tugs begin/end assistance, within the approach channel or within Elliott Bay) and why the 700-foot-wide approach channel is required, given the requirement for tug assistance.

**Literature Cited:**

USACE (2006). Hydraulic Design of Deep Draft Navigation Projects. Engineer Manual (EM) 1110-2-1613. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. May 31.

Puget Sound Pilots (2015). General Guidelines for Vessels Transiting Restricted Waterways or Ports. Revised January 27. <http://pspilots.org/wp-content/uploads/2013/01/Guidelines-Jan-27-2015.pdf>.

### Final Panel Comment 6

**It is not clear how the cost-shared General Navigation Feature (550-foot-wide channel) can remain open when two Generation IV vessels are berthed on opposite sides of the 750-foot-wide waterway.**

#### Basis for Comment

The FR/EA documents that the Federal (design) channel and the cost-shared General Navigation Feature (GNF) of the project is 550 feet wide. This proposed channel width does not allow sufficient space for berthing of the Generation IV design vessels. In a 750-foot-wide body of water (measured from pier head to pier head), only about 380 feet would be available for passage of vessels when the design vessels (beam of 185 feet) are berthed on each side of the channel. A review of the “East, West, and Duwamish Waterways Navigation Improvement Study – Final Feasibility Report and Environmental Impact Statement” (USACE, 1983) indicates that the East and West Waterways were both previously 750 feet wide and were narrowed to 500 feet to “permit ship berthing outside of the Federal channel,” (Section 6. Conclusions and Recommendations, p. 61) implying that vessel berthing within the Federal channel was not permitted. It is not clear how the design vessel with its much larger beam will be able to berth without extending into the Federal channel.

According to Engineer Pamphlet (EP) 1165-2-1, Paragraph 12-5, which pertains to cost-sharing and project cooperation for Federal navigation projects, Federal participation (cost-sharing) is limited to the design and construction of GNFs (including entrance and primary access channels); however, costs for local service facilities (LSF), including dredging in berthing areas, shall be provided by the local non-Federal interest. The Federal cost-sharing applies only to GNF areas; the report’s cost estimate assumes the entire 550-foot-wide navigation channel would be cost-shared; however, the Panel believes cost-sharing should be limited to a 380-foot-wide channel. The remaining 170 feet of channel (85 feet on either side of the waterway) should be considered LSF, as it is required for berthing of the Generation IV design vessels.

#### Significance – Medium

Without a clear understanding of where berthing will occur and what is considered the cost-shared GNF area, the channel width may not be sufficient to allow vessel traffic at the same time two Generation IV vessels are berthed on opposite sides of the waterway.

#### Recommendation for Resolution

1. Clarify what areas of the GNF, specifically the proposed channel width of 550 feet, will be cost-shared (i.e., is dredging of the entire 550-foot-channel cost-shared, or is a portion of it considered LSF).
2. Clarify what areas will be reserved for vessel berthing.
3. If the 550-foot Federal channel remains the TSP, provide justification for allowing vessels in berthing areas to extend/overlap into the proposed 550-foot-wide navigation channel.

**Literature Cited:**

USACE (1999). Digest of Water Resources Policies and Authorities. Engineer Pamphlet (EP) 1165-2-1. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. July 30.

USACE (1983). East, West, and Duwamish Waterways Navigation Improvement Study – Final Feasibility Report and Environmental Impact Statement. Department of the Army, U.S. Army Corp of Engineers, Seattle District, January.

### Final Panel Comment 7

**The qualitative underwater noise impact analysis for the with-project condition does not consider the possibility of increased noise levels from the projected use of larger vessels, due to the use of larger positioning thrusters and propulsion units, and the potential need for larger or more numerous tending vessels necessary to safely maneuver them.**

#### Basis for Comment

The FR/EA qualitatively asserts that there will be less noise in the marine environment as a component of the Locally Preferred Plan (LPP). This is based on the assumption that, by accommodating larger ships through deepening of the navigation channel, there will be a net decrease in vessel calls (15%). Fewer vessel calls would lead to less container ship traffic and associated noise introduced through tending. This would have a net reduction in the cumulative effects of ambient underwater noise in Puget Sound, which would benefit the Endangered Species Act-listed Southern Resident killer whales.

However, it could similarly be argued that larger vessels would introduce more noise to the marine environment through larger positioning thrusters and propulsion units. Tending vessels might also need to be larger or more numerous to safely accommodate/maneuver the vessels.

Historically, the background noise level of the working Seattle waterfront has increased to an average of 127-128 dB (24 hour average) above the assumed historical average of 120 dB (Laughlin, 2011).

#### Significance – Low

The long-term benefits from reduced impacts on marine mammals in the with-project condition cannot be fully substantiated without providing information on the noise created or the noise reduced by the larger vessels or the tenders necessary to safely maneuver them.

#### Recommendation for Resolution

1. Evaluate current noise associated with shipping practices over the area of influence. Try to determine what noise level each ship class produces and limit the analysis to any classes that create source noise levels above the current criterion for marine mammal disturbance due to continuous noise (120 dB RMS).
2. Determine the likely source level for the proposed ship classes that would be expected to call on the Port.
3. If recommendations 1 and/or 2 can be addressed, compare the overall noise levels of the with-project condition vessels (larger vessels) against the projected without-project condition (smaller vessels) to determine the cumulative sound exposure, identifying whether there is an actual reduction.

#### Literature Cited:

Laughlin, J. (2011). Seattle Ferry Terminal Background Sound Measurement Results – FINAL Technical Memorandum. Washington State Department of Transportation, Seattle, WA. May 18.

## 5. REFERENCES

Laughlin, J. (2011). Seattle Ferry Terminal Background Sound Measurement Results – FINAL Technical Memorandum. Washington State Department of Transportation. Seattle, WA. May 18.

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.

Puget Sound Pilots (2015). General Guidelines for Vessels Transiting Restricted Waterways or Ports. Revised January 27 .Available online at: <http://pspilots.org/wp-content/uploads/2013/01/Guidelines-Jan-27-2015.pdf>

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 (1983). East, West, and Duwamish Waterways Navigation Improvement Study – Final Feasibility Report and Environmental Impact Statement, Department of the Army, U.S. Army Corp of Engineers, Seattle District. January.

USACE (1999). Digest of Water Resources Policies and Authorities. Engineer Pamphlet (EP) 1165-2-1. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. July 30.

USACE (2006). Hydraulic Design of Deep Draft Navigation Projects. Engineer Manual (EM) 1110-2-1613. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. May 31.

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 Seattle Harbor Project

This page is intentionally left blank.

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

Table A-1 presents the schedule followed in executing the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington Independent External Peer Review (hereinafter: Seattle Harbor IEPR). Due dates for milestones and deliverables are based on the award/effective date of July 20, 2016. The review documents were provided by U.S. Army Corps of Engineers (USACE) on July 29, 2016. Note that the work items listed under Task 6 occur after the submission of this report.

Battelle will enter the seven 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. Seattle Harbor Complete IEPR Schedule**

Task	Action	Due Date
1	Award/Effective Date	7/20/2016
	Review documents available	7/29/2016
	Public comments available	9/2/2016
	Battelle submits draft Work Plan to USACE <sup>a</sup>	7/27/2016
	USACE provides comments on draft Work Plan to Battelle	8/3/2016
	Battelle submits final Work Plan to USACE <sup>a</sup>	8/5/2016
2	Battelle requests input on the conflict of interest (COI) questionnaire from USACE	7/21/2016
	USACE provides comments on COI questionnaire to Battelle	7/23/2016
	Battelle submits list of selected panel members to USACE <sup>a</sup>	7/28/2016
	USACE confirms the panel members have no COI	7/29/2016
	Battelle completes subcontracts for panel members	8/4/2016
3	Battelle convenes kick-off meeting with USACE	7/28/2016
	Battelle sends review documents to panel members	8/4/2016
	Battelle convenes kick-off meeting with panel members	8/8/2016
	Battelle convenes kick-off meeting with USACE and panel members	8/8/2016
	Battelle submits mid-review questions from the panel members to USACE for clarification in lieu of mid-review teleconference	8/19/2016
4	Panel members complete their individual reviews	8/25/2016

**Table A-1. Seattle Harbor Complete IEPR Schedule (continued)**

Task	Action	Due Date
4	Battelle provides talking points for Panel Review Teleconference to panel members	8/30/2016
	Battelle convenes Panel Review Teleconference	8/31/2016
	Battelle provides Final Panel Comment templates and instructions to panel members	9/1/2016
	Panel members provide draft Final Panel Comments to Battelle	9/9/2016
	Battelle provides feedback on draft Final Panel Comments to panel members; panel members revise Final Panel Comments	9/10-9/15/2016
	Panel finalizes Final Panel Comments	9/16/2016
	Battelle sends public comments to Panel	9/6/2016
	Panel completes its review of public comments	9/19/2016
	Battelle and Panel review Panel's responses to public comments	9/19/2016
	Panel drafts Final Panel Comment for public comments, if needed	Not Applicable
	Panel finalizes Final Panel Comment regarding public comments, if needed	Not applicable
5	Battelle provides Final IEPR Report to panel members for review	9/19/2016
	Panel members provide comments on Final IEPR Report to Battelle	9/21/2016
	Battelle submits Final IEPR Report to USACE <sup>a</sup>	9/23/2016
	USACE Planning Center of Expertise (PCX) provides decision on Final IEPR Report acceptance to Battelle	9/30/2016
6 <sup>b</sup>	Battelle inputs Final Panel Comments to DrChecks and provides Final Panel Comment response template to USACE	10/4/2016
	Battelle convenes teleconference to review the Post-Final Panel Comment Response Process with USACE	10/4/2016
	Battelle convenes teleconference to review the Post-Final Panel Comment Response Process with Panel	10/4/2016
	USACE Project Delivery Team (PDT) provides draft Evaluator Responses to USACE PCX for review	10/20/2016
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	10/26/2016
	USACE PCX provides draft PDT Evaluator Responses to Battelle	10/27/2016
	Battelle provides the draft PDT Evaluator Responses to panel members	10/31/2016
	Panel members provide draft BackCheck Responses to Battelle	11/3/2016
Battelle convenes teleconference to discuss draft BackCheck Responses with panel members	11/4/2016	

**Table A-1. Seattle Harbor Complete IEPR Schedule (continued)**

Task	Action	Due Date
6 <sup>b</sup>	Battelle convenes Comment-Response Teleconference with panel members and USACE	11/7/2016
	USACE inputs final PDT Evaluator Responses to DrChecks	11/15/2016
	Battelle provides final PDT Evaluator Responses to panel members	11/17/2016
	Panel members provide final BackCheck Responses to Battelle	11/21/2016
	Battelle inputs the Panel's final BackCheck Responses in DrChecks	11/22/2016
	Battelle submits pdf printout of DrChecks project file to USACE <sup>a</sup>	11/23/2016
3 <sup>c</sup>	Agency Decision Meeting	11/4/2016
	CWRB Meeting (Estimated Date)	6/2017
	Contract End/Delivery Date	11/30/2017

*a Deliverable.*

*b Task 6 occurs after the submission of this report*

*c The ADM and CWRB meetings were listed in the Performance Work Statement under Task 3 but was relocated in this schedule to reflect the chronological order of activities.*

At the beginning of the Period of Performance for the Seattle Harbor 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 14 charge questions provided by USACE, two overview questions and a public comment-related question added by Battelle (all questions were included in the draft and final Work Plans), and general guidance for the Panel on the conduct of the peer review (provided in Appendix C of this final report).

Prior to beginning their review and within one day 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 Seattle Harbor review documents and supplemental information listed in Table A-2, and other USACE reference materials.

**Table A-2. Seattle Harbor Documents to Be Reviewed**

Review Documents	No. of Review Pages
Integrated Feasibility Report/Environmental Assessment	120
Appendix A: Economics	122
Appendix B: Engineering	36
Appendix C: Supplemental Information on Affected Environment	19
Appendix D: Environmental Compliance Documents	108
Appendix E: Cost Estimate	66
Appendix F: Real Estate	10
Appendix G: HTRW	32
<b>Total number of pages to be reviewed</b>	<b>513</b>
Supplemental Information (reference only – not reviewed)	
Public Comments	21
Risk Register	6 worksheets
Decision Log & Milestone MFRs	9

**Documents for Reference**

- USACE guidance, *Civil Works Review* (EC 1165-2-214), December 15, 2012
- Office of Management and Budget, *Final Information Quality Bulletin for Peer Review*, December 16, 2004.
- Foundations of SMART Planning
- SMART Planning Bulletin (PB 2013-03)
- SMART – Planning Overview
- USACE Planning Modernization Summary
- Engineering and Construction Bulletin (ECB) 2012-18: Engineering Within the Planning Modernization Paradigm
- USACE Climate Change Adaptation Plan (June 2014)
- ETL 1100-2-1 – Procedures to Evaluate SLR Change Impacts Responses Adaptation
- ER 1100-2-8162 – Incorporating SLR Change in CW Programs

About halfway through the review of the Seattle Harbor IEPR documents, the Panel provided Battelle with four questions for USACE to answer regarding the project. USACE provided responses to the four questions via email and provided additional data in response to one question.

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

- USACE 2015a\_DMMP MFR.pdf
- USACE 2015c\_DMMP Biological Evaluation.pdf
- (USACE 2015a) – signed USACE\_Seattle\_Harbor\_GI\_West\_Waterway-DMMP\_Advisory\_Memorandum\_September\_2015.pdf
- (USACE 2-15b) – MFR\_150512\_Ship Simulation Meeting Notes\_Final.pdf
- (USACE 2016) – MFR\_SeattleHarbor\_O&MDredging\_Volumes.pdf
- (USACE 2015c) MFR\_SeattleHarbor\_DredgeVolumeCalculationMethod\_06082015 – Final.pdf
- Seattle Harbor Salinity Modeling Letter Report – FINAL.pdf
- Seattle Harbor\_Tidal Info.docx

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

The Panel was instructed to address the charge questions/discussion points within the charge 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 seven overall comments and discussion points. Each panel member's individual comments were shared with the full Panel in a merged individual comments table.

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

Battelle facilitated a 2.5-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 Seattle Harbor 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 the merged individual comments table, a summary 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 member 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 SMART 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 SMART 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, seven 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.

## A.5 Conduct of the Public Comment Review

Battelle received a PDF file containing 21 pages of public comments on the Seattle Harbor (approximately 13 written comments and one transcript) from USACE on September 2, 2016. Battelle then sent the public comments to the panel members on September 6, 2016 in addition to the following charge question:

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

The Panel produced individual comments in response to the charge question. Battelle reviewed the comments to identify any new technical concerns that had not been previously identified during the initial IEPR. Upon review, Battelle determined and the Panel confirmed that no new issues or concerns were identified. However, the Panel noted that some of the issues raised in the public comments were similar to concerns raised in the IEPR Final Panel Comments, particularly the channel width versus berthing areas in each waterway.

This page is intentionally left blank.

# APPENDIX B

## Identification and Selection of IEPR Panel Members for the Seattle Harbor Project

This page is intentionally left blank.

## B.1 Panel Identification

The candidates for the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington (hereinafter: Seattle Harbor IEPR) Panel were evaluated based on their technical expertise in the following key areas: economics, environmental compliance, and coastal/hydraulic engineering. These areas correspond to the technical content of the Seattle Harbor IEPR review documents and overall scope of the Seattle Harbor 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.<sup>1</sup> 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 firm<sup>2</sup> in the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington.
- Previous and/or current involvement by you or your firm<sup>2</sup> in deep draft navigation studies in the Pacific Northwest, specifically, Seattle Harbor, Washington.
- Previous and/or current involvement by you or your firm<sup>2</sup> in the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington or in any related projects.
- Previous and/or current involvement by you or your firm<sup>2</sup> in the conceptual or actual design, construction, or operation and maintenance (O&M) of any projects in the Seattle Harbor, Washington, and/or King County, Washington area.

---

<sup>1</sup> 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."

<sup>2</sup> 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.

- Current employment by USACE.
- Previous and/or current involvement with paid or unpaid expert testimony related to the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington.
- Previous and/or current employment or affiliation with the non-Federal sponsors or any of the following cooperating Federal, state, county, local, and regional agencies, environmental organizations, and interested groups: Port of Seattle, Northwest Seaport Alliance, Washington State Department of Natural Resources, and the U.S. Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)/Superfund program (for pay or pro bono).
- Past, current, or future interests or involvements (financial or otherwise) by you, your spouse, or your children related to Seattle Harbor, Washington.
- 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 Seattle District.
- Previous or current involvement with the development/testing of models, including HarborSym and RECONS, that will be used for or in support of the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington, project.
- Current firm<sup>2</sup> involvement with other USACE projects, specifically those projects/contracts that are with the Seattle 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 Seattle District. Please explain.
- Any previous employment by USACE as a direct employee, notably if employment was with the Seattle 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 firm<sup>2</sup>) within the last 10 years, notably if those projects/contracts are with the Seattle 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 deep draft navigation, and include the client/agency and duration of review (approximate dates).
- Pending, current, or future financial interests in the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington, project or in related contracts/awards from USACE.
- Significant portion of your personal or office's revenues within the last three years came from USACE contracts.
- Significant portion of your personal or office's revenues within the last three years came from Port of Seattle or Northwest Seaport Alliance contracts.

- Any publicly documented statement (including, for example, advocating for or discouraging against) related to the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington, project.
- Participation in prior and/or current Federal studies relevant to any of the following projects and/or the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington, project.
  - Final Environmental Impact Statement (August 1975) and Supplement (June 1979), Seattle Harbor Maintenance, U.S. Army Corps of Engineers, Seattle District.
  - Final Feasibility Report and Final Environmental Impact Statement for East, West, and Duwamish Waterways Navigation Improvement Study (January 1983), U.S. Army Corps of Engineers, Seattle District.
  - East Waterway Channel Deepening, Stage I Project Report, Seattle Harbor, Washington (January 1999), U.S. Army Corps of Engineers, Seattle District.
- Previous and/or current participation in prior non-Federal studies relevant to any of the projects listed above and/or the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington, project.
- 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.

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. Seattle Harbor IEPR Panel: Technical Criteria and Areas of Expertise**

Technical Criterion	Cone	Stutes	Giovannozzi
<b>Economics</b>			
Minimum 15 years of demonstrated experience or combined equivalent of education and experience in deep draft navigation economics, specifically with containerized commodities	X		
Very familiar with USACE plan formulation process, procedures, and standards	X		
Demonstrated experience in plan formulation/evaluation of alternative plans for USACE' deep draft navigation channel improvement studies	X		
Very familiar with USACE procedures and standards for deep draft navigation economic analyses	X		
Demonstrated experience in formulating and evaluating alternative plans for deep draft navigation projects as well as conducting National Economic Development analyses of those projects	X		
Required knowledge of tools employed for economic analysis, including HarborSym, risk analysis, and trade/fleet forecasts	X		
Experience directly working for or with USACE in applying Principles and Guidelines (P&G) to Civil Works project evaluations	X		
Active participation in related professional societies is encouraged	X		
<b>Environmental Compliance</b>			
Minimum 15 years of demonstrated experience directly related to water resource environmental evaluation or review and National Environmental Policy Act (NEPA) compliance for deep draft navigation projects (channel improvements) and dredged material placement		X	
M.S. degree or higher in a related field		X	
Expert in Northwest biology, specifically knowledge of endangered coastal species including salmonids		X	
Familiar with USACE environmental analyses including a general knowledge of environmental statutes and compliance processes		X	
Preferred experience with Hazardous, Toxic, and Radioactive Waste (HTRW) regulations and compliance processes, including a general knowledge of CERCLA/Superfund compliance processes		X	
Expert in compliance requirements of environmental laws, policies, and regulations, including the Fish and Wildlife Coordination Act and the Endangered Species Act		X	

**Table B-1. Seattle Harbor IEPR Panel: Technical Criteria and Areas of Expertise (continued)**

Technical Criterion	Cone	Stutes	Giovannozzi
<b>Coastal/Hydraulic Engineering</b>			
Minimum 15 years of experience in coastal/hydraulic engineering of deep draft navigation projects			<b>X</b>
Extensive experience designing navigation improvement projects in tidally influenced systems, including channel deepening projects			<b>X</b>
Familiar with USACE coastal engineering requirements for feasibility studies (including channel design and effects of navigation channels on currents, sedimentation, and water quality)			<b>X</b>
Specialized experience in dredging projects			<b>X</b>
Registered professional engineer (P.E.)			<b>X</b>

### B.3 Panel Member Qualifications

<b>Steven R. Cone</b>	
<b>Role:</b> Economics	<b>Affiliation:</b> SR Cone Consulting LLC

**Mr. Cone** is an independent consultant and former Senior Economist and Policy Advisor. He retired from USACE in 2007, with 37 years of experience in policy, planning, and economics. He spent 18 years at HQUSACE and was a rehired annuitant with IWR for 5 years from 2007 to 2012. Mr. Cone's primary experience has been as a senior economist and policy advisor. He has worked directly for or with USACE in applying Principles and Guidelines (P&G) to Civil Works project evaluations. At HQUSACE, Mr. Cone prepared and interpreted planning and policy guidance, led policy review teams for feasibility and post-authorization reports, and prepared reports of the Chief of Engineers for new and modified project authorizations. Mr. Cone is a widely recognized expert in various aspects of Civil Works policy, planning, and economic analyses, including harbor navigation planning studies.

He has more than 15 years demonstrated experience or combined equivalent of education and experience in deep draft navigation economics, specifically with containerized commodities. He is very familiar with USACE procedures and standards for deep draft navigation economic analyses and has demonstrated experience in formulating and evaluating alternative plans, including National Economic Development (NED) analyses for deep draft navigation projects. While a retired annuitant at IWR, he served as a senior economist providing planning support for economic benefit analysis for a project to deepen the harbor at Savannah, Georgia. He was part of a team that developed new methodologies for economic benefit evaluation of containerized commodities that established the basic foundation for the

development of the HarborSym Deepening Model and Containership Loading Tools. He reviewed model testing results and model documentation, but was not part of the HarborSym development or its creation.

Mr. Cone is also familiar with USACE plan formulation processes, procedures, and standards and has demonstrated experience in plan formulation and evaluation of alternative plans for USACE's deep draft navigation channel improvement studies. For the Charleston Harbor Post 45 Feasibility Study, (Charleston District), he served as the plan formulation and economic advisor for alternatives evaluation, NED economic benefits analysis, and document review and revision for a project to make modifications to Charleston, South Carolina harbor for deep draft navigation improvements.

Besides HarborSym, he has knowledge of other tools employed for economic analysis, including risk analysis and trade/fleet forecasts. NED navigation benefits require trade and fleet forecasts and HarborSym has risk measurements via the input variables.

Other notable deep draft navigation planning studies that he has worked on in either a planning and/or economic advisor capacity include Jacksonville Harbor, Port Everglades, Houston Ship Channel, and San Francisco Bay to Stockton.

## Jason P. Stutes, Ph.D.

**Role:** Environmental Compliance

**Affiliation:** Hart Crowser, Inc.

**Dr. Stutes** is a nearshore ecologist with over 16 years of expertise related to water resource environmental evaluation and review and NEPA compliance for deep draft navigation projects. His specific expertise focuses on the analysis of project-level effects (e.g., dredged material placement, shading, and other habitat modifications) on nearshore ecosystems under the Endangered Species Act (ESA), Fish and Wildlife Coordination Act, and the National Environmental Policy Act (NEPA). Dr. Stutes understands environmental laws and compliance measures for deep draft/dredging projects in Puget Sound waters due to not only the number of ESA-listed species (and their critical habitat) that must be taken into account, but also relevant Puget Sound Dredged Material Management Program (DMMP) guidance and Washington State's Model Toxics Control Act (MTCA). He is also familiar with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Superfund compliance in many cases.

He is an expert in Pacific Northwest biology, specifically knowledge of such endangered species as salmonids, marine mammals, shore birds, and rock fish. Dr. Stutes has performed numerous habitat surveys and functional assessments for nearshore projects ranging from simple boat launches for municipalities to multimodal piers for world class ports. Many of these projects focus on footprint effects on habitats that support a diverse assemblage of animals and plants including shellfish, macroalgae, and eelgrass. This experience demonstrates his proficiency in navigating the permit process for nearshore projects and evaluating them for project-related impacts, ESA-listed species use, restoration potential, and potential contamination threats. He has consulted for numerous multidisciplinary teams tasked with conceptualizing, designing, permitting, and implementing restoration actions in the Pacific Northwest. As a nearshore benthic ecologist, Dr. Stutes is able to inform the regulatory process on issues related to habitat function and ecosystem services, minimizing permit timelines and maximizing the value of

mitigation actions for clients. He is a recognized expert in nearshore and benthic ecology and periodically reviews articles for international journals on the subject.

Dr. Stutes' diverse technical expertise includes characterizing nearshore habitat, conducting long-term monitoring, characterizing food webs, constructing carbon and nitrogen budgets for estuarine settings, and sampling/processing water quality parameters. He has been involved in several projects where dredging has been used to improve navigation for channels, as well as ports and marinas, including the Port of Everett Jetty Island Beneficial Reuse of Dredge Spoils Project, Alaska Pipeline Project, Point Thomson Project, Port of Everett South Terminal Project, Skagway Multimodal Project, Custom Plywood Remediation Project, and many marina projects. He has evaluated the impacts and recovery of these systems based on the existing infauna assemblage, size/depth of the proposed dredge, level of contamination of dredge materials, and level of intermittent disturbance due to boat traffic and scour. He has also been involved in permitting (including pre-dredge baseline studies and impact and recovery assessment) on multiple nearshore infrastructure projects (including dredging projects) in the State of Washington (Puget Sound, Bellingham Bay, Hood Canal) and in Alaska (Cook Inlet, Beaufort Sea, Sitka Sound, Lynn Canal). He has also conducted several studies on the acoustic and water quality effects of dredging on nearshore ecosystems.

Dr. Stutes has prepared marine biological sections of numerous NEPA and Washington State Environmental Policy Act (SEPA) environmental impact statements (EISs) and environmental assessments (EAs) in Washington (Port Gamble Bay Restoration Project, EHW2 Pier Project, Terminal 5 Expansion Project, Thorndyke Resources Conveyor Project, Willapa Bay Imidacloprid Application) and in Alaska (Sitka Runway expansion/fill project, Point Thomson project, Donlin Mine project). He has supported coastal projects in the Pacific Northwest stretching from the Columbia Basin to the North Slope.

Dr. Stutes is an active member of the Pacific Estuarine Research Society and the Coastal and Estuarine Research Federation (CERF). He has presented scientific results to regional (Alaska Marine Science Symposium) and international/national scientific meetings and conferences (CERF, Benthic Ecology Meeting Society).

## Michael A. Giovannozzi, P.E.

**Role:** Coastal/Hydraulic Engineering

**Affiliation:** AquaTerra Consulting International

**Mr. Giovannozzi**, a coastal engineer at AquaTerra Consulting International, has more than 16 years of experience in both government and private sectors throughout the United States in the fields of coastal and hydraulic engineering, including deep draft navigation projects. He earned a B.S. and M.S. in civil engineering from the University of Delaware. He is a registered professional engineer in Washington, Florida, Alabama, Connecticut, Georgia, South Carolina, Texas, North Carolina, New Jersey and Delaware. He worked for three years with USACE Philadelphia District (2001 – 2004), two years with USACE Seattle District (2009 – 2011), and 11 years in private consulting.

Mr. Giovannozzi has extensive experience designing navigation improvement projects in tidally influenced systems, including channel deepening projects. In the area of coastal current studies, Mr. Giovannozzi has performed extensive hydrodynamic and sediment transport modeling, morphologic analysis, and

engineering assessments for multiple projects to determine expected water levels, tidal exchange, wave conditions, and circulation patterns. While at USACE Philadelphia District, he was the hydraulic engineer for a coastal inlet hydrodynamics study that involved numerical modeling to predict sediment transport potential for several alternative sand borrow-area strategies for a Federal beach fill project near a coastal inlet in Ocean City, New Jersey. Mr. Giovannozzi was the coastal engineer for a dredging/environmental restoration project for an island community located on the Intracoastal Waterway in Palm Beach County, Florida. The work included tidal hydraulic modeling, channel optimization, and dredging costs estimates for hydraulic and mechanic dredging to restore tidal connectivity.

He is familiar with USACE coastal engineering requirements for feasibility studies (including channel design and effects of navigation channels on currents, sedimentation, and water quality). Mr. Giovannozzi has demonstrated experience in deep draft navigation channel design. Notably, he was involved in the hydrodynamic modeling and navigation studies of the canals for the World Islands Mega Project in Dubai, United Arab Emirates. The project required a balanced design that allowed for safe navigation of pleasure craft, provided sufficient flow to minimize siltation and improve tidal flow, while also minimizing shoreline erosion. The study included hydrodynamic and sediment transport modeling and determination of safe navigational clearances for vessels. In addition, Mr. Giovannozzi was the lead project engineer for a Section 905(b) Reconnaissance Study that examined the potential need for navigation improvements for the Neah Bay Entrance Channel in Washington State to enable deeper draft vessels to use the port for commerce and as a safe harbor of refuge.

Mr. Giovannozzi also has specialized experience in dredging projects. He is familiar with both mechanical and hydraulic dredging technologies and has completed the USACE Dredging Fundamentals Course. While at USACE Seattle District, he was the project manager for the outer reach of the Grays Harbor Navigation Channel Maintenance Dredging project, and also worked with Miami Dade County on several channel and berth deepening projects at the Port of Miami.

Mr. Giovannozzi also has demonstrated experience in the modification of existing channels. He was a project engineer on the Quillayute Navigation Channel Improvement Study in Washington State, which used numerical wave and current models to optimize the channel modification scheme to improve hydraulic efficiency with an aim to reducing future maintenance dredging activities. Recommendations were provided to alter the channel cross-section and to rehabilitate a nearby sea dike to optimize the channel flow. In addition, Mr. Giovannozzi assisted with a navigation study to assess the feasibility of deepening the Intracoastal Waterway to accommodate deep-draft mega-yachts at a yacht repair facility located near the Port of Palm Beach in Palm Beach County, Florida.

Mr. Giovannozzi is an active member of the American Society of Civil Engineers; Coasts, Oceans, Ports, and Rivers Institute; and the Association of Coastal Engineers. He regularly attends and presents at national and international conferences on flood damage reduction and shoreline protection. In addition, he served as the Secretary for the World Association for Waterborne Transport Infrastructure (PIANC) Recreational Committee Work Group on Marina Design and currently serves as PIANC YP-Com Vice-Chair of the Americas.

# APPENDIX C

Final Charge to the IEPR Panel as  
Submitted to USACE on August 5,  
2016 for the Seattle Harbor Project

This page is intentionally left blank.

# Charge Questions and Guidance to the Panel Members for the IEPR of the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington

## BACKGROUND

The Seattle Harbor, Washington, Navigation Improvement Project is a single-purpose deep draft navigation project located in King County, Washington. The Federally authorized East and West Waterways are located in Puget Sound's Elliott Bay at Seattle, Washington (Figure 1). The East Waterway has authorized depths from -34 to -51 feet mean lower low water (MLLW), and the West Waterway has an authorized depth of -34 feet MLLW. The Seattle Harbor study is evaluating the feasibility of deepening the channels to a depth of up to -57 feet MLLW.



Figure 1. Seattle Harbor Navigation Improvement Project Area

The purpose of the proposed Federal action is to achieve transportation cost savings (increased economic efficiencies) at the East and West Waterways of Seattle Harbor. Navigational challenges have been identified in both the East and West Waterways of Seattle Harbor, and authorized depths do not meet the draft requirements of today's fleet of larger container ships. Tide restrictions, light loading, or other operational inefficiencies created by inadequate channel depth result in economic inefficiencies that translate into costs for the national economy.

Planning objectives for the study include the following:

1. Achieve transportation cost savings to and from Seattle Harbor to the extent possible over the 50-year period of analysis.
2. Develop an alternative that is environmentally sustainable for the 50-year period of analysis.
3. Reduce navigation challenges facing harbor pilots and their operating practices for the 50-year period of analysis.

The Tentatively Selected Plan (TSP) for the Seattle Harbor Navigation Improvement Project is the combination of deepening both waterways to a depth of -57 MLLW, increasing channel widths by 50 feet, and widening the approach reaches to 700 feet to improve navigation safety at the entrance to each channel (Figure 2).

The Seattle Harbor, Washington, Navigation Improvement Feasibility Report and Environmental Assessment has been developed to reflect the U.S. Army Corps of Engineers (USACE) modernized planning initiative, in which project studies use a risk-informed assessment, generally with only enough detail developed for each alternative to allow relative comparison, to determine the appropriate information to identify a TSP. Although this new process has altered the milestones and evaluation procedures in a feasibility study, the manner in which alternatives are developed from problems, opportunities, measures, and constraints remains the same.

Under the SMART Planning paradigm, IEPR occurs during concurrent review of the Decision Document, between the TSP Milestone meeting and the Agency Decision Milestone (ADM) meeting (steps 2 and 3 in Figure 3, the SMART Feasibility Study diagram). To help explain the results of the risk-informed assessment and alternative evaluation, a risk register and other risk management documentation will accompany the feasibility study decision documents. A primary objective of IEPR is to evaluate whether adequate information was available and appropriate technical analyses were completed to support selection of a TSP within the context of the risk-informed decision-making process.

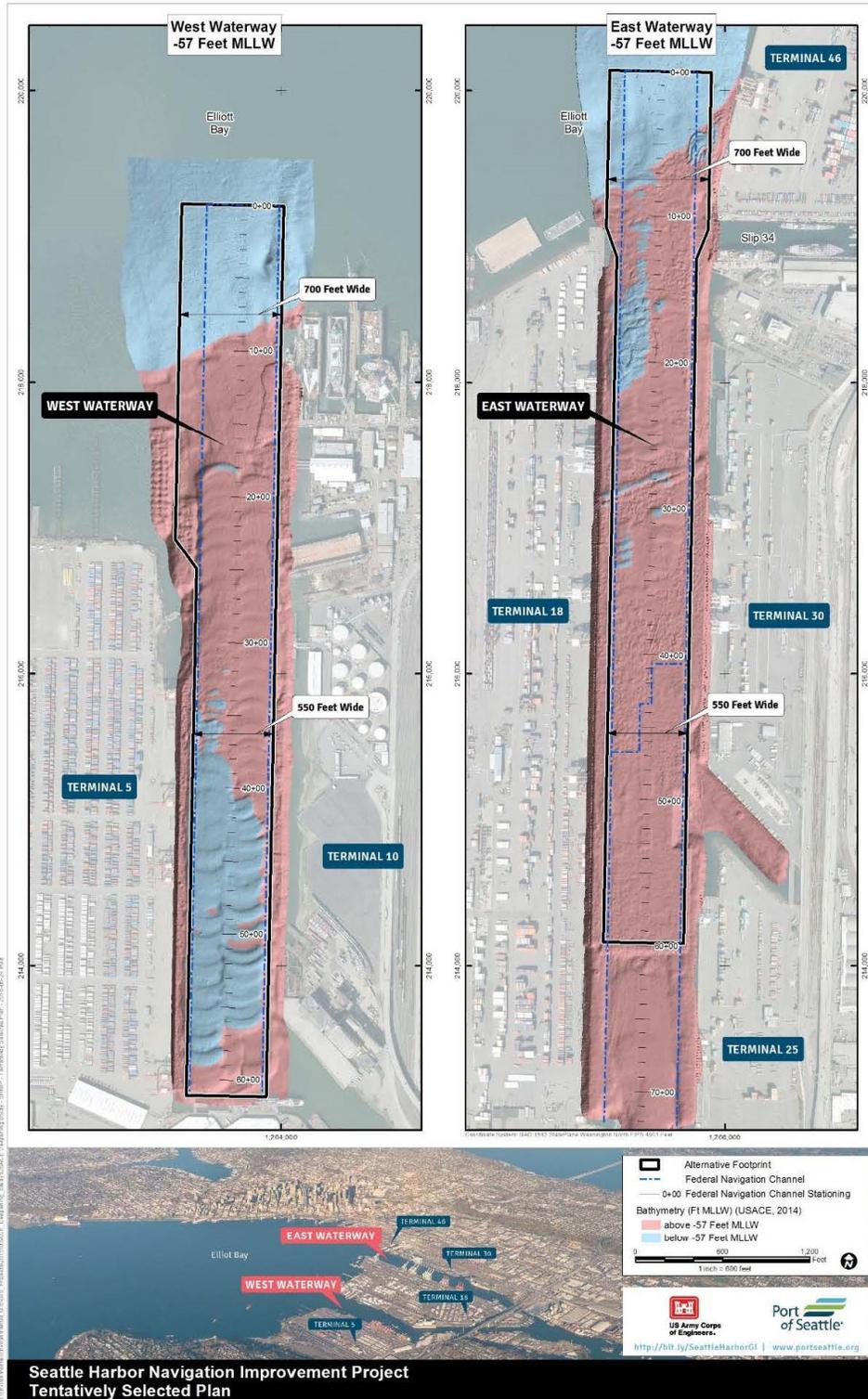


Figure 2. Tentatively Selected Plan

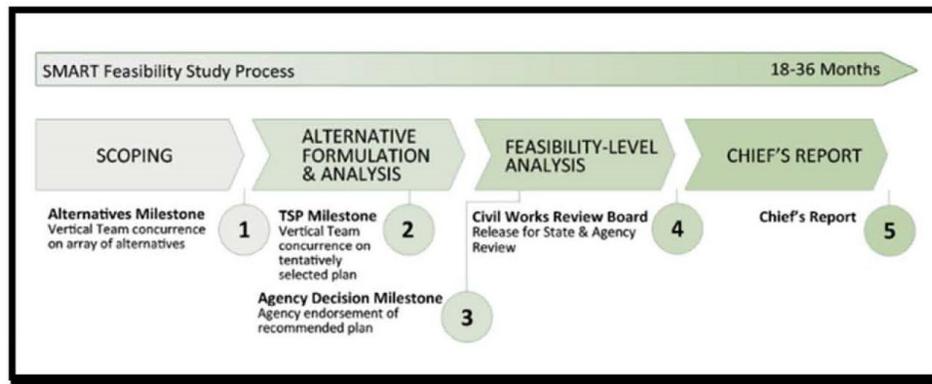


Figure 3: SMART Feasibility Study Process

## OBJECTIVES

The objective of this work is to conduct an independent external peer review (IEPR) of the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington (hereinafter: Seattle Harbor 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 Seattle Harbor 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 coastal/hydraulic engineering, environmental compliance, and economic issues relevant to the project. They will also have experience applying their subject matter expertise to deep draft 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	Subject Experts			
	No. of Review Pages	Economics	Environmental Compliance	Coastal/Hydraulic Engineer
Integrated Feasibility Report/Environmental Assessment	120	120	120	120
Appendix A: Economics	122	122		
Appendix B: Engineering	36			36
Appendix C: Supplemental Information on Affected Environment	19	19	19	19
Appendix D: Environmental Compliance Documents	108		108	
Appendix E: Cost Estimate	66	66		
Appendix F: Real Estate	10	10	10	
Appendix G: HTRW	32		32	
<b>Total number of pages to be reviewed</b>	<b>513</b>	<b>337</b>	<b>289</b>	<b>175</b>
Supplemental Information				
Public Comments (approximate page count)	50	50	50	50
Risk Register	2	2	2	2
Decision Log	9	9	9	9
<b>Total number of pages provided for reference</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>

### 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)
- Foundations of SMART Planning
- SMART Planning Bulletin (PB 2013-03)
- SMART – Planning Overview
- Planning Modernization Fact Sheet.

## SCHEDULE

This schedule is based on the July 29, 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
<b>Conduct Peer Review</b>	Battelle sends review documents to panel members	8/4/2016
	Battelle convenes kick-off meeting with panel members	8/5/2016
	Battelle convenes kick-off meeting with USACE and panel members	8/11/2016
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	8/22/2016
	Panel members complete their individual reviews	8/25/2016
<b>Prepare Final Panel Comments and Review Public Comments</b>	Battelle provides talking points for Panel Review Teleconference to panel members	8/30/2016
	Battelle convenes Panel Review Teleconference	8/31/2016
	Battelle provides Final Panel Comment templates and instructions to panel members	9/1/2016
	Panel members provide draft Final Panel Comments to Battelle	9/9/2016
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	9/10 - 9/15/2016
	Panel finalizes Final Panel Comments	9/16/2016
	Battelle receives the public comments from USACE	9/2/2016
	Battelle sends public comments to Panel	9/7/2016
	Panel completes its review of public comments	9/12/2016
	Battelle and Panel review Panel's responses to public comments	9/13/2016
	Panel drafts Final Panel Comment for public comments, if necessary	9/14/2016
	Panel finalizes Final Panel Comment regarding public comments, if necessary	9/16/2016
<b>Review Final IEPR Report</b>	Battelle provides Final IEPR Report to panel members for review	9/19/2016
	Panel members provide comments on Final IEPR Report	9/21/2016
	*Battelle submits Final IEPR Report to USACE	9/23/2016
	USACE PCX provides decision on Final IEPR Report acceptance	9/30/2016
<b>Comment/Response Process</b>	Battelle inputs Final Panel Comments to Design Review and Checking System (DrChecks) and provides Final Panel Comment response template to USACE	10/4/2016
	Battelle convenes teleconference with Panel to review the Comment Response Process	10/4/2016

Task	Action	Due Date
<b>Comment/ Response Process</b>	USACE Project Delivery Team (PDT) provides draft Evaluator Responses to USACE Planning Center of Expertise (PCX) for review	10/20/2016
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	10/26/2016
	USACE PCX provides draft PDT Evaluator Responses to Battelle	10/27/2016
	Battelle provides draft PDT Evaluator Responses to panel members	10/31/2016
	Panel members provide draft BackCheck Responses to Battelle	11/3/2016
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	11/4/2016
	Battelle convenes Comment-Response Teleconference with panel members and USACE	11/7/2016
	USACE inputs final PDT Evaluator Responses to DrChecks	11/15/2016
	Battelle provides final PDT Evaluator Responses to panel members	11/17/2016
	Panel members provide final BackCheck Responses to Battelle	11/21/2016
	Battelle inputs panel members' final BackCheck Responses to DrChecks	11/22/2016
	*Battelle submits pdf printout of DrChecks project file	11/23/2016
<b>ADM</b>	Agency Decision Milestone Meeting	11/4/2016
<b>CWRB</b>	Civil Works Review Board Meeting	June 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 Seattle Harbor 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 Seattle Harbor 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](mailto:mcleod@battelle.org)) or Program Manager (Rachel Sell; [sellr@battelle.org](mailto:sellr@battelle.org)) for requests or additional information.
3. In case of media contact, notify the Battelle Program Manager, Rachel Sell ([sellr@battelle.org](mailto: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 **Lynn McLeod**, [mcleod@battelle.org](mailto:mcleod@battelle.org), no later than August 25, 2016, 10 pm ET.

**Independent External Peer Review**  
**of the**  
**Seattle Harbor, Washington, Navigation Improvement Project**  
**Feasibility Report and Environmental Assessment, King County, Washington**

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

The following Charge to Reviewers outlines the objectives of the Independent External Peer Review (IEPR) for the Seattle Harbor, Washington, Navigation Improvement Project Feasibility Report and Environmental Assessment, King County, Washington, and identifies specific items for consideration by the IEPR Panel.

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

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

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

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

### **Broad Evaluation Review Charge Questions**

1. Are the need for and intent of the decision document clear?
2. Does the decision document adequately address the stated need and intent relative to scientific and technical issues?
3. Given the need for and intent of the decision document, assess the adequacy and acceptability of the project evaluation data used in the study analyses.
4. Given the need for and intent of the decision document, assess the adequacy and acceptability of the economic, environmental, and engineering assumptions that underlie the study analyses.
5. Given the need for and intent of the decision document, assess the adequacy and acceptability of the economic, environmental, and engineering methodologies, analyses, and projections.
6. Given the need for and intent of the decision document, assess the adequacy and acceptability of the models used in the evaluation of existing and future without-project conditions and of economic or environmental impacts of alternatives.
7. Given the need for and intent of the decision document, assess the adequacy and acceptability of the methods for integrating risk and uncertainty.
8. Given the need for and intent of the decision document, assess the adequacy and acceptability of the formulation of alternative plans and the range of alternative plans considered.
9. Given the need for and intent of the decision document, assess the adequacy and acceptability of the quality and quantity of the surveys, investigations, and engineering sufficient for conceptual design of alternative plans.
10. Given the need for and intent of the decision document, assess the adequacy and acceptability of the overall assessment of significant environmental impacts and any biological analyses.
11. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable.
12. Assess the considered and tentatively selected alternatives from the perspective of systems, including systemic aspects being considered from a temporal perspective and specifically addressing the potential effects of climate change.

### **Specific Technical and Scientific Review Charge Questions**

13. Evaluate whether study-specific economics assumptions are reasonable, including baseline market share for Seattle, appropriateness of low-growth projections used in the economic analysis, route group assignments, and appropriateness of design vessel assumptions; and
14. Evaluate whether assumptions relating to ongoing Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)/Superfund actions (specifically, the East Waterway

remediation feasibility study) are reasonable, including assumptions regarding quantities of material requiring upland disposal after a remedy is implemented.

### **Battelle Summary Charge Questions to the Panel Members<sup>3</sup>**

#### **Summary Questions**

15. 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.
16. Please provide positive feedback on the project and/or review documents.

#### **Public Comment Questions**

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

---

<sup>3</sup> Questions 15 through 17 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 August 5, 2016.

This page is intentionally left blank.

# APPENDIX D

## Conflict of Interest Form

This page is intentionally left blank.

Eric Thor  
USACE, Institute for Water Resources  
July 13, 2016  
C-2

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

**SEATTLE HARBOR, WASHINGTON, NAVIGATION IMPROVEMENT PROJECT  
FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT**

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: **Jason M. Jenkins**  
TELEPHONE: **614-424-4873**  
ADDRESS: **505 King Avenue, Columbus, OH 43201**  
EMAIL ADDRESS: **jenkinsj@battelle.org**

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

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

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

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

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

**No additional information to report.**

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

\_\_\_\_\_  
July 13, 2016

---

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

