

October 18, 2013

# Final Independent External Peer Review Report San Antonio Channel Improvement Project, General Re-evaluation Report and Integrated Environmental Assessment, Westside Creeks Ecosystem Restoration, San Antonio, Texas



Prepared by  
Battelle Memorial Institute

Prepared for  
Department of the Army  
U.S. Army Corps of Engineers  
Ecosystem Restoration Planning Center of Expertise  
Rock Island District, Mississippi Valley Division

Contract No. W912HQ-10-D-0002  
Task Order: 0046





**Final Independent External Peer Review Report  
San Antonio Channel Improvement Project, General Re-evaluation  
Report and Integrated Environmental Assessment, Westside Creeks  
Ecosystem Restoration, San Antonio, Texas**

by

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for

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U.S. Army Corps of Engineers  
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# Final Independent External Peer Review Report for the

## San Antonio Channel Improvement Project, General Re-evaluation Report and Integrated Environmental Assessment, Westside Creeks Ecosystem Restoration, San Antonio, Texas

### EXECUTIVE SUMMARY

#### Project Background and Purpose

The riverine habitat of the San Antonio River system within the boundaries of the San Antonio Channel Improvement Project (SACIP) in Bexar County has been severely degraded by development along and channelization of the riparian corridor. The SACIP has successfully performed the single purpose of flood risk management (FRM); however, construction and continued operations and maintenance (O&M) have had severe ecological consequences for the riverine system along the 35-mile SACIP area that were not considered at the time of design and construction. In 2000, the single-purpose project authorization for SACIP was modified to allow ecosystem restoration and recreation to be added as project purposes. The modification provides an opportunity to consider (1) the ecological losses to the riverine habitat, and (2) the impacts those losses may have to the nation's natural resources, including loss of stop-over habitat for migratory and nesting birds utilizing the Central Flyway. Restoration opportunities for the SACIP along 9 miles of the San Antonio River have already been studied and are in the final stages of implementation. The remaining components of the SACIP under consideration for ecosystem restoration and recreation are the four tributaries along the western side of the San Antonio River mainstem: Alazán Creek, Apache Creek, Martinez Creek, and San Pedro Creek, which are referred to collectively as the Westside Creeks (WSC).

The purpose of the SACIP *General Re-evaluation Report and Environmental Assessment, Westside Creeks, Ecosystem Restoration, San Antonio, Texas*, is to identify measures for restoring the riparian ecosystem within the WSC and recreation opportunities that are compatible with the ecosystem restoration objectives. The General Re-evaluation Report (GRR) and Environmental Assessment (EA) document describes the characteristics of the existing and future without-project conditions; water-related resource problems and opportunities; planning objectives and constraints; formulation, evaluation, and comparison of alternatives; and the recommended plan. The SACIP GRR and EA document was initiated at the request of the San Antonio River Authority (SARA) to evaluate the addition of ecosystem restoration and recreation purposes to the WSC.

Changes in the hydraulic regime of the WSC over the last half-century are largely due to shifts in urbanization, the construction of the SACIP, and required O&M practices. Historic cross sections depict a more natural stream consisting of a baseflow channel, a wider channel, and a large floodplain. Straightening and channelization of the WSC yielded grass-lined trapezoidal channels, concrete banks, and an underground bypass tunnel (San Pedro). While the SACIP

conveys flood flows more quickly out of the urban area, the channelization and required maintenance have resulted in consequences for the riverine ecosystem along the 35 miles of the SACIP that were not previously considered. Channelization has led to an increased bed slope and loss of sinuosity. The result is a system where the sediment transport is out of balance; few to none of the aquatic structures necessary to support and sustain the life cycle of aquatic organisms native to the system remain; and the required shading and allochthonous inputs from the riparian corridor have been removed, severely altering the function of the historic riverine habitat.

Migratory birds using the Central Flyway have been identified as a resource of national significance within the WSC study area. The study area lies in a critical portion of that flyway, providing stop-over habitat, feeding and breeding grounds during crucial times of the migrations. Measures identified for the ecosystem restoration of the WSC to a more natural condition include the construction of riparian meadow in all areas of the creek, a pilot channel for the length of the creek (with the exception of Apache, where only the lower 0.8 mile of pilot channel would be restored), riparian woody vegetation at densities of 30 and 70 trees per acre (depending on hydraulic constraints), slackwater areas for the length of the restored pilot channel, and wetlands.

## Independent External Peer Review Process

The U.S. Army Corps of Engineers (USACE) is conducting an Independent External Peer Review (IEPR) of the San Antonio Channel Improvement Project, General Re-evaluation Report and Integrated Environmental Assessment, Westside Creeks Ecosystem Restoration, San Antonio, Texas (hereinafter Westside Creeks [WSC]). As a 501(c)(3) non-profit science and technology organization, Battelle is independent, is free from conflicts of interest (COIs), and meets the requirements for an Outside Eligible Organization (OEO) per guidance described in USACE (2012). Battelle has experience in establishing and administering peer review panels for USACE and was engaged to coordinate the IEPR of the WSC GRR/EA. Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analyses. 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 describes the IEPR process, describes the panel members and their selection, and summarizes the Final Panel Comments of the IEPR Panel (the Panel).

Based on the technical content of the WSC review documents and the overall scope of the project, Battelle identified candidates for the Panel in the following key technical areas: avian biology, hydraulic engineering, Civil Works planning, and general ecology. Four panel members were selected for the IEPR. USACE was given the list of candidate panel members, but Battelle made the final selection of the Panel.

The Panel received an electronic version of the 726-page WSC GRR and EA documents, along with a charge that solicited comments on specific sections of the documents to be reviewed. USACE prepared the charge questions following guidance provided in USACE (2012) and OMB (2004), which were included in the draft and final Work Plans.

The USACE Project Delivery Team (PDT) briefed the Panel and Battelle during a kick-off meeting held via teleconference 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 IEPR panel members reviewed the WSC documents and individually produced review comments in response to the charge questions. The panel members then met via teleconference with Battelle to review key technical comments, discuss charge questions for which there were conflicting responses, 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, or low); and (4) recommendations on how to resolve the comment. Overall, 15 Final Panel Comments were identified and documented. Of these, 1 was identified as having high significance, 10 had medium significance, and 4 had low significance with regard to how the issues identified may impact the project.

## Results of the Independent External Peer Review

The panel members agreed among one another 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 WSC 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 Appendix A of this report. The following summarizes the Panel’s findings.

The Panel agreed that the WSC review documents are comprehensive, detailed, and well written and that the WSC restoration study represents a high-quality effort to restore the riverine ecosystem within the WSC that is clearly the result of a long and detailed study. While the Panel deemed the report comprehensive with robust documentation in many areas, it identified areas where additional documentation and clarification is warranted.

**Avian Biology** – The GRR/EA includes general references to the common fish, aquatic vegetation, riparian vegetation, bird, and wildlife species that are present at the restoration site and within the reference reaches, and the study appropriately uses an avian index of biotic integrity (IBI) to compare restoration alternatives. However, a detailed characterization of faunal assemblages other than birds and fish is not provided, limiting the ability to assess the full impacts on the riparian ecosystem and the full benefits from restoration. This issue can be addressed by including a detailed characterization of faunal assemblages that occur in the project area and a description of the likely changes to these assemblages that will result from the restoration project. In addition, no information is provided on existing invertebrate food base resources for informing the linkage to and quality of habitat to complement the avian IBI. This can be addressed by conducting rapid assessment inventories of the invertebrate communities within the WSC riparian corridor and at the reference reaches to assess the relationship between lower trophic levels and the avian IBI, and to monitor the progress of the WSC restoration project.

**Hydraulic Engineering** – Under the Tentatively Selected Plan (TSP), the average creek/floodplain cross-section would have comparatively minor geometric changes; however, the

Hydrologic Engineering Center-River Analysis System (HEC-RAS) hydraulic model indicates there will be substantial reductions in water surface elevations that consequently result in reduced valley storage within the WSC project area. Potential risks and impacts from decreased valley storage and increased flow velocities are not described and discussed, and could result in substantial costs increases that could potentially change the alternative selection. This primary concern can be addressed by (1) providing a summary of the hydraulic modeling that includes comparisons of water surface elevations, channel flow velocities, valley storage, and peak flood flows under with-and without-project conditions, and (2) explaining how the TSP mitigates any potential risk and impacts associated with increases or decreases to those parameters.

**Civil Works Planning** – The Panel found that the WSC review documents adhered closely to USACE Civil Works planning policy and adequately assess the range of alternatives considered for the WSC restoration study. The panel members agreed that the process for selecting alternatives for the recommended restoration plan was thorough and well presented. The use of the avian IBI was found to be appropriate and allowed alternatives to be evaluated in an objective manner; however, the Panel also agreed that additional information on historical seeps and tributaries and on community connectivity and support should be provided to further support the alternatives selection process and to explain how the recommended restoration plan will meet the project objectives.

**General Ecology** – The effects of climate change have not been fully described, which limits the ability to assess and understand potential climate change impacts on the overall project. This can be addressed by including a discussion of the range of potential climate change effects for flood and drought conditions. In addition, the GRR/EA does not contain sufficient detail to explain how monitoring and adaptive management will occur. More detail, such as metrics and thresholds for triggering adjustment actions on the adaptive management plan, will increase the understanding of how the plan will be implemented to ensure the success of the ecosystem restoration. Finally, details are not provided on the conditions to which the vegetative community within the WSC project area will be restored and the species that would benefit from restoration. To alleviate this concern, either a full description of the vegetation assessment for the reference reach(es) or a comprehensive list of candidate riparian restoration species of trees, shrubs, and herbaceous plants used at San Antonio River restoration sites should be included in the GRR/EA.

**Table ES-1. Overview of 15 Final Panel Comments Identified by the Westside Creeks IEPR Panel**

No.	Final Panel Comment
<b>Significance – High</b>	
1	Potential risks and impacts from decreased valley storage and increased flow velocities are not described and discussed and could result in substantial cost increases that may not be uniform across the alternatives.

**Table ES-1. Overview of 15 Final Panel Comments Identified by the Westside Creeks IEPR Panel (continued)**

No.	Final Panel Comment
<b>Significance – Medium</b>	
2	The effects of climate change on future river flow, flood, and drought conditions are not discussed in sufficient detail to understand the potential future impacts to the Westside Creeks (WSC) restoration area.
3	Details are not provided on the conditions to which the vegetative community within the Westside Creeks (WSC) project area will be restored and the species that would benefit from restoration.
4	It is not clear what biological resources other than birds, fish, and vegetation are present at the Westside Creeks (WSC) restoration site and reference reaches or how the other biological resources will be affected by the project.
5	Baseline data on existing invertebrate food base resources to complement the avian index of biotic integrity (IBI) has not been provided.
6	There is not sufficient detail to explain how monitoring and adaptive management will evaluate and ensure the success of the ecosystem restoration.
7	There is no discussion to explain why additional restoration opportunities within and beyond the project right of way (ROW) are not under consideration.
8	The degree to which the San Antonio Channel Improvement Project (SACIP) has divided communities and the degree to which community connections can be restored is not clearly described and quantified.
9	The degree to which the community supports the proposed Westside Creeks (WSC) Restoration Project has not been quantified.
10	Risks and impacts from the potential build-up of creek banks from sediment deposition are not discussed.
11	Planning models and procedures only partially consider and account for potential impacts from external factors such as urbanization, habitat fragmentation, and habitat patch size.
<b>Significance – Low</b>	
12	Top soil removal could help reduce the non-native seed bank but may not eliminate it, as suggested.
13	The avian index of biotic integrity (IBI) may not be as effective for evaluating future project benefits to wetland birds as it is for other avian species.
14	The reason for using the national average for parkland acres per capita to quantify shortages of recreational resources in the Westside Creeks (WSC) project area is not well explained.
15	Graphics have not been provided to depict the conceptual cross-section, plan view, or cross-section plots, including engineered/bioengineered structures or features, for each of the alternatives considered.

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## LIST OF ACRONYMS

<b>ATR</b>	Agency Technical Review
<b>CE/ICA</b>	Cost Effectiveness / Incremental Cost Analysis
<b>CEQ</b>	Council on Environmental Quality
<b>COI</b>	Conflict of Interest
<b>DrChecks</b>	Design Review and Checking System
<b>EC</b>	Engineer Circular
<b>EA</b>	Environmental Assessment
<b>EIS</b>	Environmental Impact Statement
<b>ESA</b>	Endangered Species Act
<b>FEMA</b>	Federal Emergency Management Agency
<b>FRM</b>	Flood Risk Management
<b>GRR</b>	General Re-evaluation Report
<b>HEC-DSS</b>	Hydrologic Engineering Center-Data Storage System
<b>HEC-HMS</b>	Hydrologic Engineering Center-Hydrologic Modeling System
<b>HEC-RAS</b>	Hydrologic Engineering Center-River Analysis System
<b>HEP</b>	Habitat Evaluation Procedure
<b>HSI</b>	Habitat Suitability Index
<b>IBI</b>	Index of Biotic Integrity
<b>IEPR</b>	Independent External Peer Review
<b>IWR</b>	Institute for Water Resources
<b>NEPA</b>	National Environmental Policy Act
<b>NRPA</b>	National Recreation and Parks Association
<b>O&amp;M</b>	Operations and Maintenance
<b>OEO</b>	Outside Eligible Organization
<b>OMB</b>	Office of Management and Budget
<b>PDT</b>	Project Delivery Team
<b>PIR</b>	Project Implementation Report
<b>ROW</b>	Right of Way
<b>SACIP</b>	San Antonio Channel Improvement Project
<b>SAME</b>	Society for American Military Engineers

<b>SARA</b>	San Antonio River Authority
<b>TSP</b>	Tentatively Selected Plan
<b>USACE</b>	United States Army Corps of Engineers
<b>WRDA</b>	Water Resources Development Act
<b>WSC</b>	Westside Creeks

## 1. INTRODUCTION

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The riverine habitat of the San Antonio River system within the boundaries of the San Antonio Channel Improvement Project (SACIP) in Bexar County has been severely degraded by development along and channelization of the riparian corridor. The SACIP has successfully performed the single purpose of flood risk management (FRM); however, construction and continued operations and maintenance (O&M) have had severe ecological consequences for the riverine system along the 35-mile SACIP area that were not considered at the time of design and construction. In 2000, the single-purpose project authorization for SACIP was modified to allow ecosystem restoration and recreation to be added as project purposes. The modification provides an opportunity to consider (1) the ecological losses to the riverine habitat, and (2) the impacts those losses may have to the nation's natural resources, including loss of stop-over habitat for migratory and nesting birds utilizing the Central Flyway. Restoration opportunities for the SACIP along 9 miles of the San Antonio River have already been studied and are in the final stages of implementation. The remaining components of the SACIP under consideration for ecosystem restoration and recreation are the four tributaries along the western side of the San Antonio River mainstem: Alazán Creek, Apache Creek, Martinez Creek, and San Pedro Creek, which are referred to collectively as the Westside Creeks (WSC).

The purpose of the *SACIP General Re-evaluation Report and Environmental Assessment, Westside Creeks, Ecosystem Restoration, San Antonio, Texas*, is to identify measures for restoring the riparian ecosystem within the WSC and recreation opportunities that are compatible with the ecosystem restoration objectives. The General Re-evaluation Report (GRR) and Environmental Assessment (EA) document describes the characteristics of the existing and future without-project conditions; water-related resource problems and opportunities; planning objectives and constraints; formulation, evaluation, and comparison of alternatives; and the recommended plan. The SACIP GRR and EA document was initiated at the request of the San Antonio River Authority (SARA) to evaluate the addition of ecosystem restoration and recreation purposes to the WSC.

Changes in the hydraulic regime of the WSC over the last half-century are largely due to shifts in urbanization, the construction of the SACIP, and required O&M practices. Historic cross sections depict a more natural stream consisting of a baseflow channel, a wider channel, and a large floodplain. Straightening and channelization of the WSC yielded grass-lined trapezoidal channels, concrete banks, and an underground bypass tunnel (San Pedro). While the SACIP conveys flood flows more quickly out of the urban area, the channelization and required maintenance have resulted in consequences for the riverine ecosystem along the 35 miles of the SACIP that were not considered previously. Channelization has led to an increased bed slope and loss of sinuosity. The result is a system where the sediment transport is out of balance; few to none of the aquatic structures necessary to support and sustain the life cycle of aquatic organisms native to the system remain; and the required shading and allochthonous inputs from the riparian corridor have been removed, severely altering the function of the historic riverine habitat.

Migratory birds using the Central Flyway have been identified as a resource of national significance within the WSC study area. The study area lies in a critical portion of that flyway,

providing stop-over habitat, feeding and breeding grounds during crucial times of the migrations. Measures identified for the ecosystem restoration of the WSC to a more natural condition include the construction of riparian meadow in all areas of the creek, a pilot channel for the length of the creek (with the exception of Apache, where only the lower 0.8 mile of pilot channel would be restored), riparian woody vegetation at densities of 30 and 70 trees per acre (depending on hydraulic constraints), slackwater areas for the length of the restored pilot channel, and wetlands.

The objective of the work described here was to conduct an Independent External Peer Review (IEPR) of the San Antonio Channel Improvement Project General Re-Evaluation Report and Environmental Assessment Westside Creeks Ecosystem Restoration, San Antonio, Texas documents (hereinafter Westside Creeks [WSC]) 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 Office of Management and Budget (OMB) bulletin *Final Information Quality Bulletin for Peer Review* (OMB, 2004). Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analyses.

This final report details the IEPR process, describes the IEPR panel members and their selection, and summarizes the Final Panel Comments of the IEPR Panel on the existing environmental, economic, and engineering analyses contained in the WSC. The full text of the Final Panel Comments is presented in Appendix A.

## 2. PURPOSE OF THE IEPR

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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 economic, engineering, and environmental analysis 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 WSC was conducted and managed using contract support from Battelle, which is an Outside Eligible Organization (OEO) (as defined by EC No. 1165-2-214). Battelle, a 501(c)(3) organization under the U.S. Internal Revenue Code, has experience conducting IEPRs for USACE.

## 3. METHODS

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This section describes the method followed in selecting the members for the IEPR Panel (the Panel) and in planning and conducting the IEPR. The IEPR was conducted following procedures described by USACE (2012) and in accordance with OMB (2004) guidance. 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).

### 3.1 Planning and Schedule

At the beginning of the Period of Performance, 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. In addition, 43 charge questions were provided by USACE and included in the draft and final Work Plans. The final charge also included general guidance for the Panel on the conduct of the peer review (provided in Appendix B of this final report).

Table 1 presents the schedule followed in executing the IEPR. Due dates for milestones and deliverables are based on the award/effective date of August 1, 2013. The review documents were provided by USACE on August 16, 2013. Note that the work items listed in Task 6 occur after the submission of this report. Battelle will enter the 15 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 closure, as a final deliverable and record of the IEPR results.

**Table 1. Westside Creeks IEPR Schedule**

Task	Action	Due Date
1	Award/Effective Date	8/1/2013
	Review documents available	8/16/2013
	Battelle submits draft Work Plan <sup>a</sup>	8/23/2013
	USACE provides comments on draft Work Plan	8/30/2013
	Battelle submits final Work Plan <sup>a</sup>	9/4/2013
2	Battelle requests input from USACE on the COI questionnaire	8/6/2013
	USACE provides comments on COI questionnaire	8/8/2013
	Battelle submits list of selected panel members <sup>a</sup>	8/14/2013
	USACE confirms the panel members have no COI	8/16/2013
	Battelle completes subcontracts for panel members	8/23/2013

**Table 2. Westside Creeks IEPR Schedule (continued)**

<b>Task</b>	<b>Action</b>	<b>Due Date</b>
<b>3</b>	Battelle convenes kick-off meeting with USACE	8/8/2013
	Battelle sends review documents to panel members	8/26/2013
	Battelle convenes kick-off meeting with panel members	8/27/2013
	Battelle convenes kick-off meeting with USACE and panel members	8/27/2013
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	9/12/2013
<b>4</b>	Panel members complete their individual reviews	9/18/2013
	Battelle provides panel members with talking points for Panel Review Teleconference	9/19/2013
	Battelle convenes Panel Review Teleconference	9/24/2013
	Battelle provides Final Panel Comment templates and instructions to panel members	9/20/2013
	Panel members provide draft Final Panel Comments to Battelle	9/30/2013
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	9/30-10/9/2013
	Battelle finalizes Final Panel Comments	10/9/2013
<b>5</b>	Battelle provides Final IEPR Report to panel members for review	10/13/2013
	Panel members provide comments on Final IEPR Report	10/15/2013
	<b>Battelle submits Final IEPR Report to USACE<sup>a</sup></b>	<b>10/18/2013</b>

**Table 3. Westside Creeks IEPR Schedule (continued)**

Task	Action	Due Date
6 <sup>b</sup>	Battelle inputs Final Panel Comments to DrChecks and provides Final Panel Comment response template to USACE	10/24/2013
	Battelle convenes teleconference with USACE to review the Post-Final Panel Comment Response Process	10/24/2013
	Battelle convenes teleconference with Panel to review the Post-Final Panel Comment Response Process (if necessary)	10/24/2013
	USACE provides draft Project Delivery Team (PDT) Evaluator Responses to Battelle	10/29/2013
	Battelle provides the panel members the draft PDT Evaluator Responses	10/30/2013
	Panel members provide Battelle with draft BackCheck Responses	11/4/2013
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	11/5/2013
	Battelle convenes Comment-Response Teleconference with panel members and USACE	11/6/2013
	USACE inputs final PDT Evaluator Responses to DrChecks	11/14/2013
	Battelle provides final PDT Evaluator Responses to panel members	11/18/2013
	Panel members provide Battelle with final BackCheck Responses	11/21/2013
	Battelle inputs the panel members' final BackCheck Responses to DrChecks	11/25/2013
	Battelle submits pdf printout of DrChecks project file <sup>a</sup>	11/26/2013
	Senior Leader Meeting <sup>c</sup>	TBD
Contract End/Delivery Date	12/10/2013	

*a Deliverable.*

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

*c Participation of the IEPR Panel in the Senior Leader Meeting will require a contract cost modification*

### 3.2 Identification and Selection of IEPR Panel Members

The candidates for the Panel were evaluated based on their technical expertise in the following key areas: avian biology, hydraulic engineering, Civil Works planning, and ecology. These areas correspond to the technical content of the WSC IEPR and overall scope of the WSC.

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 COIs. Of these candidates, Battelle chose the most qualified individuals, confirmed their interest and availability, and ultimately selected four experts for the final Panel.

The four selected reviewers constituted 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 were intended to 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 San Antonio Channel Improvement Project, GRR and Integrated EA, Westside Creeks Ecosystem Restoration San Antonio, Texas and technical appendices and related projects.
- Previous and/or current involvement by you or your firm<sup>2</sup> in ecosystem restoration projects, notably for urban streams in Texas.
- Previous and/or current involvement by you or your firm<sup>2</sup> in the conceptual or actual design, construction, or O&M of any projects related to the San Antonio Channel Improvement Project, GRR and Integrated EA, Westside Creeks Ecosystem Restoration San Antonio, Texas related projects.
- Current employment by USACE.
- Previous and/or current involvement with paid or unpaid expert testimony related to the San Antonio Channel Improvement Project, GRR and Integrated EA, Westside Creeks Ecosystem Restoration San Antonio, Texas.
- Previous and/or current employment or affiliation with the non-Federal sponsor: San Antonio River Authority (SARA), or any of the following cooperating Federal, State, County, local and regional agencies, environmental organizations, and interested groups: U.S. Fish and Wildlife Service (USFWS) and Environmental Protection Agency (EPA) or other river authorities in the State of Texas (for pay or pro bono).
- Past, current or future interests or involvements (financial or otherwise) by you, your spouse or children related to the San Antonio Channel Improvement Project, GRR and Integrated EA, Westside Creeks Ecosystem Restoration San Antonio, Texas.
- Current personal involvement with other USACE projects, including whether involvement was to author any manuals or guidance documents for USACE. If yes,

<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.

provide titles of documents or description of project, dates, and location (USACE district, division, Headquarters, ERDC, etc.), and position/role. Please highlight and discuss in greater detail any projects that are specifically with the Ft. Worth District.

- Previous or current involvement with the development or testing of models (e.g., HEC-RAS) that will be used for or in support of the San Antonio Channel Improvement Project, GRR and Integrated EA, Westside Creeks Ecosystem Restoration San Antonio, Texas project.
- Current firm<sup>2</sup> involvement with other USACE projects, specifically those projects/contracts that are with the Ft. Worth 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 Ft. Worth District. Please explain.
- Any previous employment by the USACE as a direct employee, notably if employment was with the Ft. Worth District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
- Any previous employment by the 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 Ft. Worth 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 ecosystem restoration and include the client/agency and duration of review (approximate dates).
- Pending, current or future financial interests in the San Antonio Channel Improvement Project, GRR and Integrated EA, Westside Creeks Ecosystem Restoration San Antonio, Texas related contracts/awards from USACE.
- A significant portion (i.e., greater than 50%) of personal or firm<sup>2</sup> revenues within the last 3 years came from USACE contracts.
- A significant portion (i.e., greater than 50%) of personal or firm<sup>2</sup> revenues within the last 3 years from contracts with the non-federal sponsor (San Antonio River Authority (SARA)).
- Any publicly documented statement (including, for example, advocating for or discouraging against) related to the San Antonio Channel Improvement Project, GRR and Integrated EA, Westside Creeks Ecosystem Restoration San Antonio, Texas.
- Participation in relevant prior Federal studies relevant to this project and/or the San Antonio Channel Improvement Project, GRR and Integrated EA, Westside Creeks Ecosystem Restoration San Antonio, Texas.
- Previous and/or current participation in prior non-Federal studies relevant to this project and/or the San Antonio Channel Improvement Project, GRR and Integrated EA, Westside Creeks Ecosystem Restoration San Antonio, Texas.
- 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:

In selecting the final members of the Panel, Battelle chose experts who best fit the expertise areas and had no COIs. The four final reviewers were either affiliated with consulting companies or were independent consultants. 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 made the final selection of the Panel. Section 4 of this report provides names and biographical information on the panel members.

### 3.3 Conduct of the IEPR

Prior to beginning their review and within two days of their subcontracts being finalized, all 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 WSC review documents and reference materials listed below. The documents and files in bold font were provided for review; the other documents were provided for reference or supplemental information only.

- **San Antonio Channel Improvement Project, General Reevaluation Report and Environmental Assessment (124)**
- **Appendix A – Geomorphology (10)**
- **Appendix B – Hydrology & Hydraulics (21)**
- **Appendix C – Natural Resources (139)**
- **Appendix D – CE –ICA (28)**
- **Appendix E – Civil Engineering (27)**
- **Appendix F – Geotechnical Assessment (152)**
- **Appendix G – HTRW (5)**
- **Appendix H – Cultural (4)**
- **Appendix I – Socioeconomics (11)**
- **Appendix J – Recreation (34)**
- **Appendix K – Other Social Effects (32)**
- **Appendix L – Real Estate (23)**
- **Appendix M – Cost Analysis & Detailed Cost Estimate (18)**
- **Appendix N – Public Communication (15)**
- **Compiled Memorandum for Record (70)**
- **Risk Register (13)**
- USACE guidance Civil Works Review, (EC 1165-2-214) dated 15 December 2012

- Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* released December 16, 2004.

In addition, throughout the review period, USACE provided documents at the request of panel members. These documents were provided to Battelle and then disseminated 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.

- Upper San Antonio River Watershed Master Plan Draft Final Report, San Antonio River Authority, April 2013 revision
- Westside Creeks Avian IBI Model Documentation
- HEC-RAS Hydraulic models
- WSC Bankfull Discharges

About two-thirds of the way through the review of the WSC review documents, a teleconference was held with USACE, the Panel, and Battelle so that USACE could answer any questions the Panel had concerning either the review documents or the project. Prior to this teleconference, Battelle submitted six panel member questions to USACE. USACE was able to provide responses to five of the six questions during the teleconference. One of the panel member questions that required additional coordination within USACE was addressed by USACE through an email response by close of business on the day of the teleconference.

### 3.4 Review of Individual Comments

The Panel was instructed to address the charge questions/discussion points within a charge question response table 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. As a result of the review, Battelle summarized the individual comments into a preliminary list of 18 overall comments and discussion points. Each panel member's individual comments were shared with the full Panel in a merged individual comments table.

### 3.5 IEPR Panel Teleconference

Battelle facilitated a 4-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 would 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 high-level importance to the findings, and merged any related individual comments. In addition, Battelle confirmed each Final Panel Comment's level of significance to the Panel. No dissenting opinions or disagreement over issues were identified.

At the end of these discussions, the Panel identified 16 comments and discussion points that should be brought forward as Final Panel Comments.

### 3.6 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 WSC 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, 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 problem with the project that affects the current recommendation or justification of the project and which will affect the success of the project in the future, if moved forward without 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:** Affects the completeness of the report in describing the project, but will not affect the recommendation or justification of the project. Comments rated as medium indicate that the Panel does not have sufficient information to analyze or assess the methods, models, or analyses.
  3. **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 (tables, figures, equations, discussions) that was mislabeled or incorrect or data or report sections that were not clearly described or presented.
- **Guidance 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. It was determined that two of the original Final Panel Comments discussed a similar issue, and the two comments were merged into one. At the end of this process, 15 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 Appendix A of this report.

#### 4. PANEL DESCRIPTION

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Candidates for the Panel were identified using Battelle's Peer Reviewer Database, targeted Internet searches using key words (e.g., technical area, geographic region), searches of websites of universities or other compiled expert sites, and referrals. Battelle prepared a draft list of primary and backup candidate panel members (who were screened for availability, technical background, and COIs), and provided it to USACE for feedback. Battelle made the final selection of panel members.

An overview of the credentials of the final four members of the Panel and their qualifications in relation to the technical evaluation criteria is presented in Table 2. More detailed biographical information regarding each panel member and his area of technical expertise is presented in the text that follows the table.

**Table 2. Westside Creeks IEPR Panel: Technical Criteria and Areas of Expertise**

Technical Criterion	Davis	O'Brien	Fobes	Southernland
<b>Avian Biology</b>				
Minimum 10 years of demonstrated experience with projects in the southern portion of the U.S. central migratory flyway	X			
Knowledge of urban stream restoration and avian community life cycle needs as they relate to migration and breeding. <sup>3</sup>	X			
Familiar with all National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) requirements	X			
Familiar with the Endangered Species Act (ESA)	X			
Participation in related professional societies	X			
Minimum of a M.S. or higher in an appropriate field of study	X			
<b>Hydraulic Engineering</b>				
Licensed professional engineer with a minimum 10 years of experience in hydrology and/or hydraulic engineering with an emphasis on engineering projects in complex systems		X		
Demonstrated engineering experience with an emphasis on ecosystem restoration and natural channel design		X		
Demonstrated experienced with computer simulation of river systems		X		
Minimum of a M.S. or equivalent experience related to hydrology and/or hydraulic engineering		X		

<sup>3</sup> Following the August 12, 2013, kickoff teleconference, USACE confirmed that with reference to the qualification requirements for the avian biologist in the Performance Work Statement (Section 4, Task 2), the requirement to have urban stream restoration experience is the least important of the required qualifications.

**Table 2. Westside Creeks IEPR Panel: Technical Criteria and Areas of Expertise (continued)**

Technical Criterion	Davis	O'Brien	Fobes	Southerland
<b>Civil Works Planning</b>				
Minimum 10 years of experience in Civil Works planning			X	
Demonstrated experience with USACE and river engineering projects			X	
Demonstrated experience with large USACE ecosystem restoration projects			X	
Demonstrated experience with: 1) ecosystem models, 2) cost effectiveness / incremental cost analysis (CE/ICA), and 3) Institute for Water Resources (IWR) Planning Suite			X	
Very familiar with USACE civil works planning policies, methodologies, standards, and procedures.			X	
M.S. degree in relevant field			X	
<b>General Ecology</b>				
Minimum 10 years of experience directly related to water resource environmental evaluation			X	X
Extensive demonstrated experience working with riverine ecosystems			X	X
Familiar with USACE calculation and application of environmental impacts and benefits			X	X
Experience in the U.S. central migratory flyway is preferred but not required				
Familiar with all NEPA requirements			X	X
M.S. degree or higher in a related field				X

### **Craig Davis, Ph.D.**

**Role:** Avian biology expert

**Affiliation:** Independent Consultant

**Dr. Davis** is a professor and Curator of Birds Collection at the Oklahoma State University Department of Natural Resource Ecology and Management. Prior to his position at Oklahoma State, he was the avian ecologist for The Platte River Whooping Crane Trust. He earned a Ph.D.

in wildlife sciences from Texas Tech University and has more than 25 years of experience as an avian biologist conducting research focused on avian ecology and on wetland and range land habitat assessment. He teaches graduate and undergraduate courses in ornithology, wetland wildlife ecology, wildlife management techniques, and wetland ecology and management. Dr. Davis also teaches a class on Habitat Evaluation Procedures (HEPs) and habitat evaluation techniques that reviews different HEP approaches as well as the development and application of Habitat Suitability Index (HSI) Models. Dr. Davis has served as a reviewer for the Whooping Crane HSI Model developed by U.S. Geological Survey Fort Collins Research Center.

Dr. Davis' research has included studying shorebird ecology in the Playa Lakes Region of Texas, and the long-term population of migrating waterfowl in the Southern Great Plains with a focus on coastal refuges in Texas. He recently completed a study of the endangered golden-cheeked warbler near Austin, Texas. Dr. Davis is experienced in urban wetland restoration projects that involve assessment of wetland function using birds and plants as indicators. These projects required knowledge of National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) requirements and familiarity with the Endangered Species Act (ESA) to evaluate riverine wetlands and river channel restoration along the Platte River with reclamation of open-channel habitat for endangered whooping cranes, least terns, and piping plovers, as well as reviewing EIS documents related to relicensing of dams on the Platte River. Dr. Davis has also conducted wet meadow restoration work, an ongoing monitoring project of Oklahoma wetlands for the Wetlands Reserve Program, and numerous avian research projects during both the breeding and migration periods.

Dr. Davis is currently a member of the Cooper Ornithological Society, American Ornithologists' Union, Society of Wetland Scientists, The Wildlife Society, and Wilson Ornithological Society. He is past president of the Oklahoma Chapter of The Wildlife Society and is an associate editor for *Rangeland Ecology and Management*. He also was an associate editor for *Wetlands*, a consulting editor for *Wildlife Monographs*, and book editor for the *Journal of Wildlife Management*. He served on the Technical Committee of the Platte River Cooperative Agreement and was involved with developing monitoring protocols and providing recommendations for habitat management for endangered and threatened birds that use the Platte River. Of Dr. Davis' 40 publications, more than 20 focused on waterbirds and wetland ecology in a wide variety of peer-reviewed journals. Dr. Davis recently co-edited a three-volume book detailing a variety of new Wetland Research techniques that will be published later this year. Since 2003, Dr. Davis has served on the Playa Lakes Joint Venture Shorebird Planning Working Group.

### ***Jim O'Brien, P.E.***

**Role:** Hydraulic engineering

**Affiliation:** O'Brien Engineering, Inc.

**Mr. O'Brien** is Principal-in-Charge of O'Brien Engineering, Inc. He is a licensed Professional Engineer in Texas, Oklahoma, and Utah with 35 years of focused hydrology and hydraulic engineering experience. His experience includes complex hydraulic, hydrologic, and hydrodynamic modeling, analysis, and design. He is involved with projects from inception through completion, including providing quality assurance/quality control and review of modeling and reports. His project experience includes hydraulic, hydrologic, and hydrodynamic

analyses on hundreds of tributaries, creeks, and rivers; flood control simulation on the upper 1,800 square miles of the West Fork of the Trinity River; flood evaluation on a 80,000-hectare sub-basin of the Nile River, north of Khartoum, Sudan; and dam rehabilitations, evaluations, and hydraulic/hydrologic modeling for breach analyses and inundation mapping on a number of dams. He has prepared numerous flood studies and designed drainage systems. His experience includes design for culverts, detention facilities, bridges, storm sewer systems, dams, energy dissipaters, and channel drop structures.

Mr. O'Brien has been involved in a number of large, complex Civil Works projects with high public and interagency interests, including a number of municipal landfills (e.g., City of Arlington, Denton County, City of Farmers Branch); high-profile development projects; high-hazard dam safety inspections and rehabilitations for state government, municipalities, federal government (USACE Vicksburg District) and private entities; the 2,400-acre Valley Ranch, a master-planned development in Irving, Texas; and many master flood and drainage studies.

Mr. O'Brien has also been involved with several ecosystem restoration and natural channel design projects. His expert knowledge of surface water characteristics, understanding of wetlands and other ecosystems, and extensive and detailed professional involvement with hundreds of channel design, channel modeling, and channel modification projects demonstrate Mr. O'Brien's expertise with all facets of hydraulic modeling, analysis, design and mapping. His experience includes the rehabilitation of three dams maintained by the Adjutant General's Department for the Texas Army National Guard (Camp Maxey Dam Rehabilitations). Two of the dams were completely rehabilitated to improve their safety, while maintaining the environment created by the presence of the dams and their reservoirs. Work included conducting hydrologic and hydraulic analyses and completing erosion protection on the upstream face of one of the dams. At one dam, the lack of a defined spillway had produced an expansive mature wetland condition. To minimize costs and preserve the wetland and its habitat, Mr. O'Brien and his team incorporated this wetland area into the final design as a natural spillway, which preserved the wetland hydrology while protecting against erosion. For the City of Arlington, Texas, landfill project, hydraulic and hydrologic modeling and engineering analyses and floodplain evaluation services were provided to pursue an amendment with Texas Commission on Environmental Quality. The project was located in the floodplain of the West Fork of the Trinity River, and the expansion required large valley storage mitigation. Working with the team wetland ecologist, Mr. O'Brien and his team provided key analysis and design data to construct multipurpose basins that address the project storage needs while establishing large wetlands and buffer areas. Another project involved analysis and design to restore a wetland and buffer area function that had been compromised with the construction of a golf course at the confluence of Timber Creek with the Elm Fork of the Trinity River.

Mr. O'Brien has prepared thousands of miles of river system hydraulic modeling using a variety of programs, notably Hydrologic Engineering Center (HEC) programs (HEC-1, HEC-2, HEC-5, HEC-River Analysis System [RAS], HEC-Hydrologic Modeling System [HMS], HEC-Data Storage System [DSS]), as well as other USACE programs (LRD1 and NUDULLAS). He has reviewed models for accuracy of thousands of miles of river system hydraulics. One such recent project was a drainage master plan for the City of Grand Prairie, Texas, the 15th largest city in Texas, located between Dallas and Fort Worth; approximately 37% of its area is within the floodplain. The study included developing a 3-mile hydraulic model of Arbor Creek, which has

multiple bridge and culvert crossings, two drop structures, gabion-lined channel reaches, and various urban floodplain characteristics. Another recent project involved floodplain mapping of nearly 1,200 river miles in Bosque County, Texas, for the Federal Emergency Management Agency (FEMA) Map Modernization program; in addition to GIS software, HEC-RAS was used in the analysis. For flood studies, floodplain reclamations, drainage studies, drainage remediation, dam safety, watershed delineations, and a number of other related projects, Mr. O'Brien has both used and reviewed USACE models on hundreds of projects, including HEC-1 (New Mart Lake Dam, Honey Creek Flood Study and Floodplain Reclamation, and City of Garland Drainage Remediation); HEC-HMS (City of Corinth Storm Water Master Plan Reevaluation and Update, Richland College Dam Rehabilitation, and City of Grand Prairie Arbor Creek Master Drainage and Flood Study); and HEC-2 (May Lane Storm Drainage Improvements, City of Corinth Storm Water Master Plan Reevaluation and Update, and Town of Highland Park Exall and Wycliffe Avenue Dam Safety Analyses).

Mr. O'Brien has prepared hydraulic models using HEC-RAS on hundreds of projects for steady and unsteady flow. Additionally, he regularly reviews hydraulic HEC-RAS models and has reviewed hundreds of models during his career for projects such as the USACE Fort Worth District Bastrop County Cedar Creek Watershed Flood Study, Texas Army National Guard Camp Maxey Dam Rehabilitations, City of Grand Prairie Arbor Creek Drainage and Utility Repairs, Oklahoma Parks Department Clayton Lake and Carlton Lake Dams, and FEMA Multi-Hazard Flood Map Modernization. He has served as a guest lecturer on four separate occasions at the University of Texas at Arlington, responsible for lesson development, presentation content, and the presentations themselves on "Introduction to HEC-RAS" and "Modeling of Bridges and Culverts." During the past 10 years, Mr. O'Brien has prepared and presented numerous hydraulic and hydrologic in-office training modules including "Hydraulics – The Correct Modeling of Ineffective Flow," "Hydrology – Determination of Modeling Parameters," and "Hydraulics – Modeling Bridges and Culverts Using HEC-RAS."

Mr. O'Brien is an active member of the Society for American Military Engineers (SAME). He has been heavily involved in the Dallas Post since 2002, consecutively serving in a variety of capacities from Small Business Liaison to Membership Director to Programs Director and ultimately President in 2012.

### **Tim Fobes**

**Role:** Civil Works planning expert

**Affiliation:** HDR Engineering, Inc.

**Mr. Fobes** is an environmental scientist and project manager with HDR Engineering, Inc. He earned a M.S. in Biology from the Missouri State University in 1995, and has a total of 19 years of experience, including more than 13 years of experience focused on USACE Civil Works planning, with emphasis on wetland, stream and riverine ecosystem restoration. This experience also includes more than 15 years of NEPA documentation and Clean Water Act Section 404/401 permitting, wetland delineations, wetland and stream mitigation planning and design, endangered species habitat assessments, and agency coordination. He has provided direct services to USACE during this period on a variety of river engineering projects that included bioengineering and aquatic habitat developments. For the USACE Benedictine Project Implementation Report

(PIR), he managed development of NEPA documents, resource problems, alternatives analysis, existing conditions, impacts analysis, biological assessments, cultural resource assessments, construction and O&M of the site, baseline habitat conditions analysis, and environmental permitting. Proposed restoration and mitigation activities included shallow water habitat and side channels.

Mr. Fobes' experience with large ecosystem restoration projects for USACE includes Brush Creek, Lake Contrary, Grand Marais, and Sand Hill Rivers 1135 Independent Technical Reviews and several Missouri River Recovery Program projects. As project manager and lead author on the Missouri River Recovery Program, Mr. Fobes developed 10 PIRs/EAs and one EIS, all of which addressed site-specific and/or system-wide fish and wildlife habitat mitigation/ecosystem restoration on the Missouri River, as well as endangered species recovery of the pallid sturgeon. He has conducted HEP modeling; is very familiar with cost effectiveness / incremental cost analysis (CE/ICA) and Institute for Water Resources (IWR) analysis interpretation; has applied the USACE Civil Works engineer regulations and engineer manuals on FRM and ecosystem restoration studies; and has quantified impacts and benefits on ecosystem restoration projects. He has used the USACE Planning Guidance Notebook (USACE, 2000) on task orders for the USACE Kansas City, Omaha, Tulsa, St. Louis, Detroit, and New York Districts. Mr. Fobes has also managed and participated in several USACE Planning Assistance to States and 905(b) Reconnaissance Studies watershed studies. For the Flood Control & Ecosystem Restoration Reconnaissance Study Section 905(B) Report (Wears Creek Basin, Jefferson City, Missouri), he assisted the Kansas City District with a reconnaissance study section 905(b) report for the Brush Creek basin in Kansas City, Missouri, and Johnson County, Kansas, to evaluate the potential federal interest in solutions to recurring flood damages, environmental degradation, and related land and water resources needs and opportunities in the basin.

Mr. Fobes has performed nest searches in the central flyway under the Migratory Bird Treaty Act, has an understanding of avian natural history, and has performed bird air strike hazard analysis and monitoring around water resource developments near airports. He was Project Manager and lead writer on several related EISs, EAs, and categorical exclusions.

Mr. Fobes is a member of SAME. He has presented several sessions at the National Conference on Ecosystem Restoration, a large national conference focusing on the science, engineering, planning and policy of ecosystem restoration. He also participates in HDR's Aquatic Ecosystem Restoration Practice Group.

### **Mark Southerland, Ph.D., CSE, PMP**

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**Role:** General ecology expertise

**Affiliation:** Versar, Inc.

**Dr. Southerland** is a principal ecologist and Director of Ecological Sciences and Applications with Versar, Inc. He earned a Ph.D. in Biology (Ecology) from the University of North Carolina-Chapel Hill in 1985, and has 32 years of research and management experience focused on the characterization of natural systems, both terrestrial and aquatic, and their response to environmental stress and perturbations. His specific areas of expertise include biodiversity conservation, environmental impact assessment, ecosystem and habitat restoration, freshwater

and terrestrial monitoring programs, watershed analysis and natural resources planning, ecological policy development, and water quality standards and criteria.

Dr. Southerland is extremely familiar with NEPA requirements. He has produced approximately 200 EAs and EISs over the past 20 years and has extensive experience in determining appropriate impact assessment methods for projects with high public visibility. He authored the EA and EIS for mitigating noise impacts by the U.S. Air Force and the EIS for restoration of oysters in the Chesapeake Bay. He has also developed biological criteria for the Hudson River Estuary to support water resources management by the New York State Department of Environmental Conservation. He also has 10 years of experience with research and theories relating to adaptive management of wetlands mitigation. He has established himself as a national expert on NEPA analysis, representing the Council on Environmental Quality (CEQ) across the country. He is frequently cited as the primary author of CEQ guidance documents on considering biodiversity and cumulative effects under NEPA and taught the impact prediction of ecosystems section for the CEQ-Duke University NEPA course for 10 years.

Dr. Southerland is a Certified Senior Ecologist and Project Management Professional and has 10 years of experience performing wetland delineations, developing wetland mitigation plans, and restoring wetlands/floodplains within the floodplains of large river systems. Since 1993, Dr. Southerland has been involved with USACE reconnaissance and feasibility studies for environmental restoration of the Susquehanna River, Delaware River, Anacostia River, and Barnegat Bay watersheds. These projects demonstrate his extensive experience working with riverine ecosystems. In addition, he has served as chief consultant to the Maryland Biological Stream Survey since 1993 and chair of the Maryland Water Monitoring Council since 2011. He performed ICA for Barnegat Bay, New Jersey, and Wissahickon Creek, Pennsylvania, using USACE calculation and application of environmental impacts and benefits. He has managed stream assessments and stressor identification for U.S. Environmental Protection Agency Region 7 in Missouri, Kansas, Iowa, and Nebraska.

Dr. Southerland has participated in 19 professional organizations, including Environmental Impact Assessment Review, National Science Foundation-Population Biology and Physiological Ecology, SAME, and Society for Ecological Restoration. He is also an adjunct professor at Frostburg State University, member of the Howard County Environmental Sustainability Board, and member of Maryland Academy of Sciences' Scientific and Educational Advisory Council.

## 5. SUMMARY OF FINAL PANEL COMMENTS

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The panel members agreed among one another 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 WSC review documents. Table 3 lists the Final Panel Comment statements by level of significance. The full text of the Final Panel Comments is presented in Appendix A of this report. The following summarizes the Panel’s findings.

The Panel agreed that the WSC review documents are comprehensive, detailed, and well written and that the WSC restoration study represents a high-quality effort to restore the riverine ecosystem within the WSC that is clearly the result of a long and detailed study. While the Panel

deemed the report comprehensive with robust documentation in many areas, it identified areas where additional documentation and clarification is warranted.

**Avian Biology** – The GRR/EA includes general references to the common fish, aquatic vegetation, riparian vegetation, bird, and wildlife species that are present at the restoration site and within the reference reaches, and the study appropriately uses an avian index of biotic integrity (IBI) to compare restoration alternatives. However, a detailed characterization of faunal assemblages other than birds and fish is not provided, limiting the ability to assess the full impacts on the riparian ecosystem and the full benefits from restoration. This issue can be addressed by including a detailed characterization of faunal assemblages that occur in the project area and a description of the likely changes to these assemblages that will result from the restoration project. In addition, no information is provided on existing invertebrate food base resources for informing the linkage to and quality of habitat to complement the avian IBI. This can be addressed by conducting rapid assessment inventories of the invertebrate communities within the WSC riparian corridor and at the reference reaches to assess the relationship between lower trophic levels and the avian IBI, and to monitor the progress of the WSC restoration project.

**Hydraulic Engineering** – Under the Tentatively Selected Plan (TSP), the average creek/floodplain cross-section would have comparatively minor geometric changes; however, the Hydrologic Engineering Center-River Analysis System (HEC-RAS) hydraulic model indicates there will be substantial reductions in water surface elevations that consequently result in reduced valley storage within the WSC project area. Potential risks and impacts from decreased valley storage and increased flow velocities are not described and discussed, and could result in substantial costs increases that could potentially change the alternative selection. This primary concern can be addressed by (1) providing a summary of the hydraulic modeling that includes comparisons of water surface elevations, channel flow velocities, valley storage, and peak flood flows under with-and without-project conditions, and (2) explaining how the TSP mitigates any potential risk and impacts associated with increases or decreases to those parameters.

**Civil Works Planning** – The Panel found that the WSC review documents adhered closely to USACE Civil Works planning policy and adequately assess the range of alternatives considered for the WSC restoration study. The panel members agreed that the process for selecting alternatives for the recommended restoration plan was thorough and well presented. The use of the avian IBI was found to be appropriate and allowed alternatives to be evaluated in an objective manner; however, the Panel also agreed that additional information on historical seeps and tributaries and on community connectivity and support should be provided to further support the alternatives selection process and to explain how the recommended restoration plan will meet the project objectives.

**General Ecology** – The effects of climate change have not been fully described, which limits the ability to assess and understand potential climate change impacts on the overall project. This can be addressed by including a discussion of the range of potential climate change effects for flood and drought conditions. In addition, the GRR/EA does not contain sufficient detail to explain how monitoring and adaptive management will occur. More detail, such as metrics and thresholds for triggering adjustment actions on the adaptive management plan, will increase the understanding of how the plan will be implemented to ensure the success of the ecosystem

restoration. Finally, details are not provided on the conditions to which the vegetative community within the WSC project area will be restored and the species that would benefit from restoration. To alleviate this concern, either a full description of the vegetation assessment for the reference reach(es) or a comprehensive list of candidate riparian restoration species of trees, shrubs, and herbaceous plants used at San Antonio River restoration sites should be included in the GRR/EA.

**Table 3. Overview of 15 Final Panel Comments Identified by the Westside Creeks IEPR Panel**

No.	Final Panel Comment
<b>Significance – High</b>	
1	Potential risks and impacts from decreased valley storage and increased flow velocities are not described and discussed and could result in substantial cost increases that may not be uniform across the alternatives.
<b>Significance – Medium</b>	
2	The effects of climate change on future river flow, flood, and drought conditions are not discussed in sufficient detail to understand the potential future impacts to the Westside Creeks (WSC) restoration area.
3	Details are not provided on the conditions to which the vegetative community within the Westside Creeks (WSC) project area will be restored and the species that would benefit from restoration.
4	It is not clear what biological resources other than birds, fish, and vegetation are present at the Westside Creeks (WSC) restoration site and reference reaches or how the other biological resources will be affected by the project.
5	Baseline data on existing invertebrate food base resources to complement the avian index of biotic integrity (IBI) has not been provided.
6	There is not sufficient detail to explain how monitoring and adaptive management will evaluate and ensure the success of the ecosystem restoration.
7	There is no discussion to explain why additional restoration opportunities within and beyond the project right of way (ROW) are not under consideration.
8	The degree to which the San Antonio Channel Improvement Project (SACIP) has divided communities and the degree to which community connections can be restored is not clearly described and quantified.
9	The degree to which the community supports the proposed Westside Creeks (WSC) Restoration Project has not been quantified.
10	Risks and impacts from the potential build-up of creek banks from sediment deposition are not discussed.
11	Planning models and procedures only partially consider and account for potential impacts from external factors such as urbanization, habitat fragmentation, and habitat patch size.

**Table 3. Overview of 15 Final Panel Comments Identified by the Westside Creeks IEPR Panel (continued)**

No.	Final Panel Comment
<b>Significance – Low</b>	
12	Top soil removal could help reduce the non-native seed bank but may not eliminate it, as suggested.
13	The avian index of biotic integrity (IBI) may not be as effective for evaluating future project benefits to wetland birds as it is for other avian species.
14	The reason for using the national average for parkland acres per capita to quantify shortages of recreational resources in the Westside Creeks (WSC) project area is not well explained.
15	Graphics have not been provided to depict the conceptual cross-section, plan view, or cross-section plots, including engineered/bioengineered structures or features, for each of the alternatives considered.

## 6. REFERENCES

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## **APPENDIX A**

### **Final Panel Comments**

**on the**

### **Westside Creeks IEPR**

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## Final Panel Comment 1

**Potential risks and impacts from decreased valley storage and increased flow velocities are neither analyzed nor discussed and could result in substantial cost increases that may not be uniform across the alternatives.**

### Basis for Comment

As part of the plan formulation process, the alternatives analysis includes an evaluation of the net impact of the project on creek and floodplain hydraulics. Under the Tentatively Selected Plan (TSP), the average creek/floodplain cross-section would have comparatively minor geometric changes; however, the Hydrologic Engineering Center-River Analysis System (HEC-RAS) hydraulic model, which was provided in response to a request made during the mid-review call, indicates there will be substantial reductions in water surface elevations that consequently result in reduced valley storage within the Westside Creeks (WSC) project area. For instance, cross-section 11189 of San Pedro Lower 2 has a decrease in water surface elevation of about 1 foot, and the cumulative reduction in valley storage at this location is 5.5%. There are many other locations where water surface elevations will also decrease by varying degrees. However, downstream impacts from these changes are not accounted for because the HEC-RAS steady-state model does not have that capability, and no other estimation of downstream impacts is provided in the General Re-Evaluation Report (GRR) and Environmental Assessment (EA).

The model indicates reductions in valley storage for the WSC on the order of 5%. While a 5% reduction in valley storage may seem relatively minor, it is possible that the reduction would result in increases in peak flows at downstream locations that may already be subject to inundation (or are nearly so, and would become inundated during the 1% annual chance exceedance flood as a result of the increases in peak flows). The HEC-RAS model also indicates that there will be substantial increases in channel flow velocity within the WSC project area (even for the higher-frequency floods) that are well into an erosive range for most soils and natural channels (e.g. the HEC-RAS model, provided after the mid-review teleconference, shows that channel flow velocity for San Pedro Lower 1, cross section 8500, would increase from 10.80 to 11.48 feet per second). The channel flow velocity increases may be tolerable if the channel is cut in competent rock or if the TSP includes a lining capable of mitigating erosion, but this issue is not addressed. In addition to erosion within the project area, increased flow velocities could result in greater erosion or sediment deposition downstream, consequently affecting base flood elevations at downstream locations in the future. However, there could also be an immediate impact on bank stability adjacent to areas that experience increased flow velocity, putting the properties along the WSC and downstream at greater risk.

Since there is no hydrologic analysis accounting for the change in valley storage, there

is a risk that the TSP could result in unaccounted for increases in elevation downstream that could increase the flood risk for more property that will be in the floodplain. Furthermore, the increased flow velocities could result in increased channel scour, bank collapses, sedimentation, and maintenance costs. If the WSC restoration alternatives are designed to reduce erosion and/or loss of valley storage both within and outside of the restoration area, there could be substantial cost increases that may or may not be uniform across the alternatives.

### **Significance – High**

When potential downstream impacts are considered, or when designing against erosion and/or loss of valley storage, the resulting substantial cost increases could potentially affect the alternative selected for the TSP.

### **Recommendations for Resolution**

1. Provide a summary of the hydraulic modeling that includes comparisons of water surface elevations and channel flow velocities under with- and without-project conditions.
2. Provide a summary of the hydrologic modeling that includes a comparison of valley storage (or volume) and peak flood flows under with- and without-project conditions.
3. Analyze and document
  - a. The potential risk and impacts that increased channel flow velocity could have downstream and how the TSP mitigates those impacts.
  - b. The potential risk and impacts that decreased valley storage will have downstream and how the TSP mitigates those impacts.

## Final Panel Comment 2

**The effects of climate change on future river flow, flood, and drought conditions are not discussed in sufficient detail to understand the potential future impacts to the Westside Creeks (WSC) restoration area.**

### Basis for Comment

The General Re-evaluation Report (GRR) and Environmental Assessment (EA) does not consider the effects of climate change in detail. While climate change may occur in unpredictable ways, it is likely to have a significant effect on environmental conditions in the project area. A range of climate change effects should be considered and discussed with respect to both flood and drought conditions (i.e., what would be the effect of periodic higher or lower flows on the value of the habitat restored and the benefits to the aquatic and terrestrial resources).

### Significance – Medium

The effects of climate change have not been fully described, which limits the ability to assess and understand their impacts on the overall project.

### Recommendations for Resolution

1. Include a more detailed discussion of the range of potential climate change effects for both flood and drought conditions.
2. Assess the likely impacts of higher and lower flows on the stream habitat to be restored and any reductions in benefits to aquatic and terrestrial resources.

### Final Panel Comment 3

**Details are not provided on the conditions to which the vegetative community within the Westside Creeks (WSC) project area will be restored and the species that would benefit from restoration.**

#### Basis for Comment

Revegetation of the WSC riparian corridor with native plants (and corresponding plant community structure) is an integral component of the restoration alternatives analyzed. It is also important to migratory birds (food sources, nesting, etc.), which were identified as a resource of national significance for the study. Reference reaches were identified along Medio Creek, the Medina River, and the San Antonio River that could represent target community conditions; however, detailed information on riparian vegetation from studies conducted at one or more reference sites is not provided. The General Re-evaluation Report (GRR) and Environmental Assessment (EA) does provide a general overview of the historic vegetation of the San Antonio area that includes about five riparian tree species and indicates that those tree species, as well as two herbaceous riparian grass species, will be included in the restoration on page 85 in the Description of the Recommended Plan. However, having a complete plant species list from reference reaches, to which the restoration is being benchmarked, or a complete list of historical riparian plants would provide more information on the expected project outcome. This information provides assurance that the project is designed to sufficiently address the ecological objectives, as the nearby reference reaches are known to support bird diversity and abundance. From a National Environmental Policy Act (NEPA) perspective, providing detailed information on the plant species that will be restored will also fully explain that the alternatives considered and the Tentatively Selected Plan (TSP) do not intend to create nor maintain a mowed park-like setting in the future.

#### Significance – Medium

It is not possible to fully understand the restoration plan and expected outcome of the project unless details on the vegetation species and target community are provided.

#### Recommendations for Resolution

1. Provide a full description of the vegetation assessment for the reference reach(es) (preferred) or a sufficient list of candidate riparian restoration species of trees, shrubs, and herbaceous plants used at San Antonio River restoration sites.
2. Provide information on the anticipated percent tree and herbaceous coverage and dominant species that are anticipated at year 1 following construction, year 25, and at maturity (75 years).

## Final Panel Comment 4

**It is not clear what biological resources other than birds, fish, and vegetation are present at the Westside Creeks (WSC) restoration site and reference reaches or how the other biological resources will be affected by the project.**

### Basis for Comment

The General Re-evaluation Report (GRR) and Environmental Assessment (EA) includes general references to the common fish, aquatic vegetation, riparian vegetation, bird, and wildlife species that are present at the restoration site and within the reference reaches. However, a detailed characterization of faunal assemblages other than birds and fish is not provided, limiting the ability to assess the full impacts on the riparian ecosystem and the full benefits from restoration. The use of a custom avian index of biotic integrity to assess benefits and impacts of the project to migratory bird assemblages is appropriate; however, the assumption that lower trophic levels (e.g., terrestrial and aquatic invertebrates, amphibians, reptiles) of the riparian ecosystem being restored will similarly benefit is not well supported.

### Significance – Medium

Due to the limited information on biological resources, it is not clear how the restoration is expected to benefit ecological assemblages other than birds, fish, and riparian vegetation, or how successful recovery of other assemblages will be accomplished.

### Recommendations for Resolution

1. Include a detailed characterization of faunal assemblages other than birds and fish (i.e., invertebrates, amphibian, reptiles, and mammals) that occur in the project area and reference reaches.
2. Describe the likely changes to these faunal assemblages that will result from the restoration project.

## Final Panel Comment 5

**Baseline data on existing invertebrate food base resources to complement the avian index of biotic integrity (IBI) has not been provided.**

### Basis for Comment

One of the main objectives of Westside Creeks (WSC) restoration is to provide stopover habitat for migratory birds. The General Re-evaluation Report (GRR) and Environmental Assessment (EA) emphasizes that these habitats are critical to migratory birds because they allow the birds to replenish depleted nutrient and energy reserves by foraging on insects, seeds, and fruits. Because of the importance of these habitats to migratory birds, an avian IBI was developed and then applied as a metric in order to compare no action against alternative restoration project scenarios. One rationale for using the avian community as an ecological metric for comparison of restoration options is that migratory birds represent the highest trophic levels in the riparian ecosystem; therefore, they provide linkage to lower trophic levels within the ecosystem and, ultimately, represent overall ecosystem health. The Panel agrees with this logic, but it also believes that without conducting a cursory assessment of lower-trophic organisms (e.g., invertebrates), sole reliance on the avian IBI to assess habitat quality may be misleading. Without any baseline information on the existing lower-trophic-level invertebrate community composition and abundances within the WSC riparian corridor and at selected reference reaches, it will be difficult to (1) effectively determine habitat quality for migratory birds, and (2) conclude that the high value metrics of the avian IBI equates to excellent habitat quality (including abundant and diverse invertebrate food resources).

### Significance – Medium

Inclusion of baseline data on invertebrate community structure will better inform the linkage between the avian IBI metrics and habitat quality, which includes food resources for migratory birds.

### Recommendations for Resolution

1. Conduct rapid assessment inventories of the invertebrate communities within the WSC riparian corridor and at the reference reaches to assess the relationship between lower trophic levels and the avian IBI.
2. Include rapid assessment inventory of the invertebrate community as a tool for monitoring the progress of the WSC restoration project.

## Final Panel Comment 6

**There is not sufficient detail to explain how monitoring and adaptive management will evaluate and ensure the success of the ecosystem restoration.**

### Basis for Comment

The General Re-evaluation Report (GRR) and Environmental Assessment (EA) states that the project will take an adaptive management approach to ensure successful restoration of the riparian corridor. This approach is necessary for adjusting to inevitable changes in conditions, and the Panel concurs with this approach. In particular, the success of the riparian plantings will depend on weather and other local conditions. However, the GRR/EA does not contain sufficient detail to explain how monitoring and adaptive management will occur. In particular, specific metrics for evaluating restoration success or thresholds that would trigger adaptive management are not provided. These metrics or thresholds are needed to evaluate the likely success of the project.

### Significance – Medium

More detail on the adaptive management plan will increase the understanding of how it will be implemented to ensure the success of the ecosystem restoration.

### Recommendations for Resolution

1. Expand on the existing adaptive management plan by including metrics and thresholds for triggering adjustment actions.
2. Explain the specific adjustment actions that will be implemented when each threshold is reached.

## Final Panel Comment 7

**There is no discussion to explain why additional restoration opportunities within and beyond the project right of way (ROW) are not under consideration.**

### Basis for Comment

The General Re-evaluation Report (GRR) and Environmental Assessment (EA) proposes specific channel and riparian restoration that will undoubtedly provide significant benefits to ecological resources, including migratory birds which are a resource of national significance. In fact, the GRR/EA makes a strong case that this restoration project is especially important and should be as ambitious as possible. However, there is no clear explanation for why the project is not expanded within and outside the current ROW, leveraging relationships with local entities where the U.S. Army Corps of Engineers (USACE) does not have jurisdiction. In particular, restoring the historical seeps and small tributaries to the main channel would greatly benefit the restoration, but the GRR/EA does not explain why expanded restoration is not under consideration or, at a minimum, why such expansion is not possible.

### Significance – Medium

Unless the reasons for not expanding restoration are explained, it is unclear whether the maximum benefit is being achieved or what additional restoration opportunities are available for local partners.

### Recommendations for Resolution

1. Describe potential options to expand restoration efforts within and beyond the project ROW, or identify the limitations that prevent this expansion.
2. Describe the location of historical seeps and small tributaries to the main channel, currently within and outside the ROW that were considered in this analysis.
3. Evaluate the relationships with local partners that could be used to expand the benefits of the project through additional restoration activities.

## Final Panel Comment 8

**The degree to which the San Antonio Channel Improvement Project (SACIP) has divided communities and the degree to which community connections can be restored is not clearly described and quantified.**

### Basis for Comment

Community connectivity through recreation is an objective of the Westside Creeks (WSC) project (page 29 of the General Re-evaluation Report [GRR] and Environmental Assessment [EA]), but there is no measurable element assigned to that objective. There are several locations in the GRR/EA and supporting appendices where the current conditions of the channelized WSC is reported to cause physical and psychological disconnection of people, communities, and community resources (e.g., parks). For example, Appendix K, page K2, states that the current condition of the channelized creeks has caused the community to be

“...physically and psychologically disconnected from other communities and community amenities as well as from the creeks. The outcome of multiple impediments that prevent individuals or groups from participating fully in the social and environmental life of the society in which they live is key to the communities’ perspective of their social exclusion. This concept characterizes a form of social disadvantage or obstruction from environmental resources.”

However, no analysis has been conducted to quantify how the SACIP has resulted in the disconnection of communities, and there is no basis, such as social science peer-reviewed literature citations, to substantiate this statement.

The current condition of the channel does not appear to be the root cause for “physical” disconnection of people, communities, and community resources from each other. Rather, it appears that low-water crossings, bridges, and trails that existed prior to the SACIP were removed, and their removal is the root cause of physical disconnection. This conclusion is based on the observation that there are many dead-end streets along the creeks that potentially were once connected. The GRR/EA (including Appendix K) does not discuss (1) the number of crossings and trails that were removed during the SACIP, (2) the ways that the local communities used these crossings and trails, or (3) the number of crossings and trails that currently exist compared to what existed prior to the SACIP.

Appendix K, page K2, of the GRR/EA indicates that during public workshops spearheaded by the San Antonio River Authority,

“...the communities reflected on the unique and rich history of Westside

Creeks prior to the channelization when the creeks were known for swimming, fishing, a source for community gathering, enjoyment, and relaxation.”

However, there is no quantitative evaluation or discussion of how people from the local communities currently feel about the various disconnection issues. The local sponsors intend to nearly maximize the federal cost-share benefit for community connectivity through recreation. As such, there is a significant amount of potential federal investment (about 9% of total project value) in recreational features. That potential investment is not well validated because the GRR/EA (including Appendix K) has not quantified (1) the percentage of the population that agrees that social benefits will derive from the WSC project, or (2) what WSC project features would benefit them most.

### Significance – Medium

Without quantitative analysis of actual (versus perceived) community disconnection, it is difficult to assess the cause of any disconnection and the degree to which it has occurred.

### Recommendations for Resolution

1. Quantify the goal of community connectivity through recreation opportunities (for example, by indicating the number of pedestrian bridges that will be constructed per mile of stream).
2. Quantify the number of lost low-water, bridge, or trail connections that existed prior to the SACIP channelization to document the loss of more proximate and more numerous physical connections.
3. Reference (1) peer-reviewed social science research that can corroborate the degree to which psychological disconnection and social exclusion/disadvantage or obstruction from environmental resources has occurred, and/or (2) quantitative community survey data to gauge these social issues.
4. Quantify the comments received regarding community disconnection provided at various public meetings.
5. Explain how people, communities, and community resources will reconnect with the addition of eight pedestrian trail bridges across the WSC channels at various locations.

## Final Panel Comment 9

**The degree to which the community supports the proposed Westside Creeks (WSC) Restoration Project has not been quantified.**

### Basis for Comment

Community support and “buy in” to the WSC Restoration Project is critical for the project to be successful. During the planning stages of the WSC Restoration Project, two scoping meetings with the affected community were held to ascertain their concerns about the project. It would be helpful if the community’s concerns, as well as the level of support, for WSC restoration were further clarified and included in the General Re-evaluation Report (GRR) and Environmental Assessment (EA). Members of the community may generally support the project, but they may not be aware of, and consequently not concerned about, unforeseen aspects of the project as construction begins and later after the project has been completed. For example, members of a community may not realize that the habitat along the creek will be maintained in a more natural state rather than a manicured, park-like state. This may not be in accordance with local residents’ aesthetic preferences. An understanding of the local community’s values and perceptions may provide the U.S. Army Corps of Engineers (USACE) and the San Antonio River Authority (SARA) a different perspective and understanding of the issues that may affect project success.

### Significance – Medium

Without understanding the community’s concerns about current and future impacts from the WSC project, the analysis of alternatives is incomplete and USACE and the SARA may be less prepared to circumvent potential issues in the future and assure long-term success of the project.

### Recommendations for Resolution

1. Clarify and summarize, to the extent possible, the local community’s attitudes toward and perceptions of WSC restoration. Specifically, explain in more detail the community’s concerns and level of support.
2. If such information is not available, consider conducting a more formalized survey of the community.

## Final Panel Comment 10

**Risks and impacts from the potential build-up of creek banks from sediment deposition are not discussed.**

### Basis for Comment

One of the risks that is not addressed in the General Re-evaluation Report (GRR) and Environmental Assessment (EA) is the potential long-term, gradual build-up of sediments on restored (native vegetated) channel banks. This build-up could reduce the future hydraulic capacity of the Westside Creeks (WSC) to the extent that it could potentially lead to increased localized flooding and result in flood damage impacts to structures (residential and business). Information has not been provided on sediment deposition rates that could be used to determine the timeframe in which sediment accumulation is significant enough to potentially reduce the hydraulic capacity. The Panel does not believe that extensive sediment transport does or will occur in the WSC channels due to extensive impervious cover (a process that could result in a limited watershed sediment source, an anticipated “fixed in place” future channel that does not erode or meander, and slight increases in flood velocities); nevertheless the banks of the flood control channel are still the effective floodplain for sediment deposition. Although the pilot channels being proposed are to carry the bank full channel-forming events that normally transport most of a stream’s sediment load, other flood control channel projects have experienced long-term gradual sediment deposition and build-up that have altered the hydraulic cross-sectional area within the “bank full” zone. One of the panel members has observed that stream confluence and inner channel bend areas on the Blue River Channel Modification Project, a U.S. Army Corps of Engineers (USACE)-constructed flood control channel in Kansas City, are susceptible to build-up.

Despite the positive aspects of channel banks acting as a filter, the localized flooding risks at WSC may increase if the hydraulic cross-sectional area changes significantly (in some areas, enough to cause a rise condition) because the design capacity of the San Antonio Channel Improvement Project (SACIP) has been reduced. To mitigate changes in hydraulic cross-sections, it may be necessary to periodically excavate sediment build-up from select channel banks, which in turn could impact and damage established native vegetation communities temporarily or permanently. The other risk and potential impact of accumulated sediment build-up on channel banks is that established species may get smothered by sediment and that, gradually, early successional native and non-native plants will be transported in by water, air, or animals and replace those established native plant communities.

Finally, sediment build-up that must be maintained by the local sponsor is not discussed on GRR/EA pages 96-97 under “Operation, Maintenance, Repair, Replacement, Rehabilitation (OMRR&R).”

### Significance – Medium

Unless the potential for long-term sediment deposition and build-up is understood and managed, flood risks could increase, resulting in more localized flooding impacts of residential and business structures, as well as restored riparian vegetation, because design capacity has been reduced.

### Recommendations for Resolution

1. Discuss the risks and impacts from sediment deposition and build-up over time to structures in the floodplain and the restored riparian ecosystem, including what is known about sediment deposition rates, how flood risks may increase over the long term, and the timeframe within which increased risks may be observed.
2. Describe the local sponsor operations and maintenance (O&M) requirements that would be used to address these risks, such as minor excavation to remove accumulations and reseeding/replanting.
3. Build an engineered level of safety into the design, by slightly enlarging the channel cross-section to increase the hydraulic capacity, to account for sediment deposition on channel banks overall, which may reduce or eliminate local sponsor maintenance of accumulated sediments and eliminate any potential risks and/or impacts from sediment build-up on channel banks.

## Final Panel Comment 11

**Planning models and procedures only partially consider and account for potential impacts from external factors such as urbanization, habitat fragmentation, and habitat patch size.**

### Basis for Comment

Several factors besides the quality and quantity of restored habitat could limit the success of the ecosystem restoration. A heavily urbanized area such as that for the Westside Creeks (WSC) project may affect bird use of the restoration area. The avian index of biotic integrity attempts to consider the impact of the surrounding area (e.g., percent development within a certain distance from the habitat), but this still may not completely address the impact of the surrounding urbanized environment, particularly on migratory bird use. Many migratory bird species are influenced by (1) habitat patch size (i.e., they may not use areas that are below a certain size threshold), (2) amount of habitat fragmentation, and/or (3) the amount of disturbance to the surrounding landscape. These types of issues may prevent certain avian species, and possibly other taxa, from using a site. Based on the bird survey data that were collected from the reference reach, it appears that a diverse avian community can be attracted to these riparian habitats, demonstrating that the WSC restoration project may provide important stopover habitat for Neotropical migrants. However, other limiting factors besides the quality and quantity of the restored habitat may also impact avian use of the habitat. For the most part, these external factors cannot be mediated, but they do need to be identified and discussed because they could affect the success of the restoration project.

### Significance – Medium

The potential influence of external factors on habitat use of the WSC project area by Neotropical migrants and other species must be understood in order to fully realize the risks and uncertainty associated with meeting project goals.

### Recommendations for Resolution

1. Discuss the potential impacts from external factors such as habitat fragmentation, habitat patch size, and landscape disturbance, and describe how these factors could affect the success of the project.

## Final Panel Comment 12

**Top soil removal could help reduce the non-native seed bank but may not eliminate it, as suggested.**

### Basis for Comment

There are multiple statements throughout the General Re-evaluation Report (GRR) and Environmental Assessment (EA) that reports removing the top six inches of topsoil will “remove” or “eliminate” the weed seed bank as first cited on pages 60 and 67. Over time, non-native seed will migrate down through cracks in the soil. During construction of the Westside Creeks (WSC) project, non-native seed will invariably be transported on newly exposed soil by wind, water, or animals. Therefore, although removal of the top six inches of soil may significantly reduce the non-native seed bank (as this is where the greatest density of seed occurs), it is unlikely that non-native species will be eliminated. In addition, invasive plant species are a pervasive problem that should be acknowledged as an on-going restoration problem that will have to be dealt with during construction, vegetation establishment, and operations.

### Significance – Low

The statement that removal of the top six inches of soil will “eliminate” non-native species may be misleading and give the impression that the effort to manage invasive species may be minimal.

### Recommendations for Resolution

1. Replace the word “eliminate”, when referring to the non-native seed bank, with “reduce” or another more representative word.
2. Acknowledge that invasive species are an ongoing restoration problem that will have to be dealt with, and indicate how performance standards referenced in Appendix C will be met.

## Final Panel Comment 13

**The avian index of biotic integrity (IBI) may not be as effective for evaluating future project benefits to wetland birds as it is for other avian species.**

### Basis for Comment

The General Re-evaluation Report (GRR) and Environmental Assessment (EA) discusses the importance of the Westside Creeks (WSC) project in providing habitat for birds that depend on wetlands (i.e., waterfowl, shorebirds, and wading birds). Although avian surveys of the reference site did report that some of these species occur at the reference site, wetland-dependent birds did not exhibit a strong correlation with IBI metrics and therefore were not used in the final IBI assessment. That does not mean that the avian IBI is flawed, and the Panel does not see this as a major concern because it is unlikely that shorebirds will use the restored riparian habitats in great numbers. However, this limitation should be recognized when assessing the alternative plans and assessing habitat quality of the WSC project. One of the main drivers for shorebird use of aquatic habitat is the amount of wetland habitat surrounding a site. Specifically, shorebirds are more likely to use a site if it occurs in a complex of wetlands (Farmer and Parent, 1997; Albanese et al., 2012). The riparian habitat that will be created through the WSC project will be of importance to Neotropical migrant songbirds, but it may not be as important for wetland-dependent birds.

### Significance – Low

Because the GRR/EA emphasizes the importance of the WSC project in providing habitat for wetland birds, the weak correlation of reference site wetland birds with IBI metrics could be misconstrued as the inability of the IBI to predict change in habitat quantity and quality.

### Recommendations for Resolution

1. Explain why the IBI did not work well for wetland-dependent birds (particularly shorebirds).
2. Clarify and, if appropriate, downplay the importance of the WSC project in providing habitat for wetland-dependent birds, particularly shorebirds.

### Literature Cited:

Albanese, G., Davis, C. A., and Compton, B. W. (2012). Spatiotemporal scaling of North American continental interior wetlands: implications for shorebird conservation. *Land-scape Ecol.* 27:1465-1479.

Farmer, A.H., and Parent, A.H. (1997). Effects of the broad scale on shorebird movements at spring migration stopovers. *Condor* 99:698-707.

## Final Panel Comment 14

**The reason for using the national average for parkland acres per capita to quantify shortages of recreational resources in the Westside Creeks (WSC) project area is not well explained.**

### Basis for Comment

Providing recreational opportunities is an important objective of the WSC project. Typically, nationally recommended guidelines are used to assess current and planned recreational resources and opportunities. However, for the WSC project, the national parkland acreage average of 16 acres per capita is compared to that in the West Subarea (the location of the WSC project) 2005 data, resulting in apparent recreational acreage shortage of 2,787 in the WSC study area. Although this may be a suitable comparison, it doesn't reflect national per capita recreational planning guidance, which would provide a more objective technical comparison of existing and proposed recreation acreage in the WSC area. National Recreation and Parks Association (NRPA) guidance (NRPA, 2013) indicates 6 to 19 acres per capita as a national guideline based on the studies conducted across the United States. Reductions or increases in the recreational acreage shortage reported for the WSC area in the GRR could result by using the NRPA national guideline.

### Significance – Low

The approach to assessing shortages of recreational resources may not seem objective if use of the national average as a benchmark instead of the NRPA national acreage per capita range guidelines is not explained.

### Recommendations for Resolution

1. Briefly explain how the national average for parkland acres per capita was determined and why it was used for the assessment.
2. Evaluate parkland acres per capita shortages in the WSC project area using NRPA guidance and report for comparison.

### Literature Cited:

NRPA (2013). Guidance for Parks and Recreation in Underserved Areas: A Public Health Perspective. National Recreation and Parks Association (NRPA). Available at ([http://www.nrpa.org/uploadedFiles/nrpa.org/Publications\\_and\\_Research/Research/Papers/Parks-Rec-Underserved-Areas.pdf](http://www.nrpa.org/uploadedFiles/nrpa.org/Publications_and_Research/Research/Papers/Parks-Rec-Underserved-Areas.pdf))

## Final Panel Comment 15

**Graphics have not been provided to depict the conceptual cross-section, plan view, or cross-section plots, including engineered/bioengineered structures or features, for each of the alternatives considered.**

### Basis for Comment

The conceptual design for each alternative considered for the Westside Creeks (WSC) restoration project include many types of engineered/bioengineered structures such as vegetation, pilot channels, pools, riffles, and slackwater that can be utilized for natural stream design. These details bear significantly on the effectiveness of the project for ecological restoration, erosion and flood impacts. The descriptions in the General Re-Evaluation Report (GRR) and Environmental Assessment (EA) do not adequately convey the type and extent of proposed geometry changes or the key areas for specific plantings. Furthermore, no graphics were provided for the proposed structures or features (e.g., pools, riffles, and slackwater). Inclusion of these graphics and more detailed descriptions of the stream restoration designs would more clearly demonstrate what the full range of all the project design features would look like. The limited graphics provided suggest that rock vanes as the main feature. Lastly, typical and specific cross-section plots from hydraulic models can be used to show proposed changes in channel geometry and loss parameters.

### Significance – Low

Graphics and a more detailed description of all project aquatic design features would improve documentation of the project design. Cross-section plots will significantly enhance the understanding of the project.

### Recommendations for Resolution

1. Include graphics and more detailed descriptions for the all the cited engineered/bioengineered structures/features mentioned plus any additional structures/features.
2. Provide typical cross-sections of the channel, floodplain and proposed vegetation to convey general concepts and objectives presented in the GRR/EA and illustrate geometric constraints such as crossings or houses.
3. Provide plotted comparisons of specific hydraulic model cross-sections to demonstrate proposed geometry and justify selected model loss parameters.

## **APPENDIX B**

**Final Charge to the Independent External Peer Review Panel  
as Submitted to USACE on September 4, 2013**

**on the**

**Westside Creeks IEPR**

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**Charge Questions and Guidance to the Panel Members  
for the  
Independent External Peer Review of the  
San Antonio Channel Improvement Project  
General Re-Evaluation Report and Integrated Environmental Assessment  
Westside Creeks Ecosystem Restoration  
San Antonio, Texas**

## **BACKGROUND**

The riverine habitat of the San Antonio River system within the boundaries of the San Antonio Channel Improvement Project (SACIP) in Bexar County has been severely degraded. The SACIP has successfully performed the single purpose of Flood Risk Management (FRM); however, construction and continued operations and maintenance have had severe ecological consequences for the riverine system along the 35 mile SACIP that were not considered at the time of design and construction. In 2000, the single purpose project authorization for SACIP was modified to allow ecosystem restoration and recreation to be added as project purposes, thereby providing an opportunity to consider the ecological losses to the riverine habitat and the impacts those losses may have to the Nation's natural resources including loss of stop-over habitat for migratory and nesting birds utilizing the Central Flyway. Restoration opportunities for the SACIP along nine miles of the San Antonio River have already been studied and are in the final stages of implementation. The remaining components of the SACIP under consideration for ecosystem restoration and recreation are the four tributaries along the western side of the San Antonio River mainstem. These four tributaries are Alazán Creek, Apache Creek, Martinez Creek, and San Pedro Creek, and are referred to collectively as the Westside Creeks (WSC).

The purpose of the SACIP General Re-evaluation Report (GRR) and Environmental Assessment (EA), Westside Creeks (WSC), Ecosystem Restoration, San Antonio, Texas, is to identify ecosystem restoration measures to restore the riverine ecosystem within the WSC that is severely degraded due to the construction and continuing maintenance of the authorized and constructed SACIP and identify recreation opportunities that are compatible with the ecosystem restoration objectives. The GRR and integrated EA describe the characteristics of the existing and future without project conditions, water related resource problems and opportunities, planning objectives and constraints, formulation, evaluation, and comparison of alternatives, and identifies a recommended plan. The SACIP was authorized under the Flood Control Act of 1954, Section 203, as part of a comprehensive plan for Flood Risk Management (FRM) in the Guadalupe and San Antonio River Basins. The authorization was modified in the Water Resources Development Act (WRDA) of 1976, Section 103, and WRDA 2000, Section 335. The modifications added ecosystem restoration and recreation as authorized purposes. The SACIP, GRR and EA was initiated at the request of the San Antonio River Authority (SARA) to evaluate the addition of ecosystem restoration and recreation purposes to the WSC. The Feasibility Cost Sharing Agreement for the study was executed on February 25, 2012. The WSC study area encompasses those portions of Martinez Creek, Alazán Creek, Apache Creek, and San Pedro Creek within the originally constructed SACIP footprint. These creeks, collectively known as the WSC, are located west of the San Antonio River on the west side of San Antonio.

Changes in the hydraulic regime of the WSC over the last half-century are largely due to shifts in urbanization, the construction of the SACIP, and required operation and maintenance practices. Historic cross sections depict a more natural stream, consisting of a baseflow channel, a wider channel and a large floodplain. Straightening and channelization of the WSC yielded grass-lined trapezoidal channels, concrete banks, and an underground bypass tunnel (San Pedro). While the SACIP conveys flood flows

more quickly out of the urban area, the channelization and required maintenance have resulted in unconsidered consequences for the riverine ecosystem along the 35 miles of the SACIP. Channelization has led to an increased bed slope and loss of sinuosity. The result is a system where the sediment transport is out of balance, few to none of the aquatic structures necessary to support and sustain the life cycle of aquatic organisms native to the system remain, and the required shading and allochthonous inputs from the riparian corridor have been removed, severely altering the function of the historic riverine habitat.

The Resource of National Significance for the study has been identified as migratory birds using the Central Flyway. The study area lies in a critical portion of that flyway, providing stop over habitat, feeding and breeding grounds during crucial times of the migrations. Measures identified for the ecosystem restoration of the WSC to a more natural condition include riparian meadow (RM) in all areas of the creek, pilot channel (PC) for the length of the creek (with the exception of Apache where only the lower 0.8 miles of pilot channel would be restored), riparian woody vegetation (RWV) at densities of 30- and 70-trees per acre depending on hydraulic constraints, slackwater (SW) areas for the length of the restored pilot channel, and wetlands (WL).

## OBJECTIVES

The objective of this work is to conduct an independent external peer review (IEPR) of the San Antonio Channel Improvement Project, General Re-Evaluation Report and Integrated Environmental Assessment, Westside Creeks Ecosystem Restoration, San Antonio, Texas (hereinafter: Westside Creeks IEPR) in accordance with the Department of the Army, USACE, Water Resources Policies and Authorities' *Civil Works Review* (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 Westside Creeks 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 avian biology, hydraulic engineering, Civil Works planning, and general ecology issues relevant to the project. They will also have experience applying their subject matter expertise to ecosystem restoration.

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:

Title	Approx. No. of Pages	Required Disciplines
San Antonio Channel Improvement Project, General Re-evaluation Report and Environmental Assessment	124	All Disciplines
Appendix A – Geomorphology	10	Hydraulic Engineer
Appendix B – Hydrology & Hydraulics	21	Hydraulic Engineer
Appendix C – Natural Resources	139	Avian Biologist, Civil Works Planner, General Ecologist
Appendix D – CE –ICA	28	Hydraulic Engineer & Civil Works Planner
Appendix E – Civil Engineering	27	Hydraulic Engineer & Civil Works Planner
Appendix F – Geotechnical Assessment	152	Hydraulic Engineer
Appendix G - HTRW	5	All Disciplines
Appendix H - Cultural	4	All Disciplines
Appendix I - Socioeconomics	11	Civil Works Planner
Appendix J - Recreation	34	Avian Biologist, Civil Works Planner, General Ecologist
Appendix K – Other Social Effects	32	Civil Works Planner
Appendix L – Real Estate	23	Civil Works Planner
Appendix M – Cost Analysis & Detailed Cost Estimate	18	All Disciplines
Appendix N – Public Communication	15	All Disciplines
Compiled Memorandum for Record	70	All Disciplines
Risk Register	13	All Disciplines
<b>Total Page Count</b>	<b>726</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).

## **SCHEDULE**

This draft schedule is based on the August 16, 2013 receipt of the final review documents. The schedule will be revised upon receipt of final review documents.

Task	Action	Due Date
<b>Conduct Peer Review</b>	Battelle sends review documents to panel members	8/26/2013
	Battelle convenes kick-off meeting with panel members	8/27/2013
	Battelle convenes kick-off meeting with USACE and panel members	8/29/2013
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	9/12/2013
	Panel members complete their individual reviews	9/18/2013
<b>Prepare Final Panel Comments and Final IEPR Report</b>	Battelle provides panel members with talking points for Panel Review Teleconference	9/23/2013
	Battelle convenes Panel Review Teleconference	9/24/2013
	Battelle provides Final Panel Comment templates and instructions to panel members	9/25/2013
	Panel members provide draft Final Panel Comments to Battelle	10/2/2013
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	10/15-10/24/2013
	Battelle finalizes Final Panel Comments	10/11/2013
	Battelle provides Final IEPR Report to panel members for review	10/16/2013
	Panel members provide comments on Final IEPR Report	10/18/2013
<b>Comment/Response Process</b>	*Battelle submits Final IEPR Report to USACE	10/22/2013
	Battelle inputs Final Panel Comments to DrChecks and provides Final Panel Comment response template to USACE	10/24/2013
	Battelle convenes teleconference with Panel to review the Post-Final Panel Comment Response Process (if necessary)	10/24/2013
	USACE provides draft PDT Evaluator Responses to Battelle	10/29/2013
	Battelle provides the panel members the draft PDT Evaluator Responses	10/30/2013
	Panel members provide Battelle with draft BackCheck Responses	11/4/2013
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	11/5/2013
	Battelle convenes Comment-Response Teleconference with panel members and USACE	11/6/2013
	USACE inputs final PDT Evaluator Responses to DrChecks	11/14/2013
	Battelle provides PDT Evaluator Responses to panel members	11/18/2013
Panel members provide Battelle with final BackCheck Responses	11/21/2013	
Battelle inputs the panel members' final BackCheck Responses to DrChecks	11/25/2013	

Task	Action	Due Date
	*Battelle submits pdf printout of DrChecks project file	11/26/2013

## CHARGE FOR PEER REVIEW

Members of this IEPR Panel are asked to determine whether the technical approach and scientific rationale presented in the Westside Creeks documents are credible and whether the conclusions are valid. The Panel is asked to determine whether the technical work is adequate, competently performed, 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 Westside Creek 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 (Amanda Maxemchuk, [maxemchuka@battelle.org](mailto:maxemchuka@battelle.org)) or Deputy 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, Karen Johnson-Young ([johnson-youngk@battelle.org](mailto:johnson-youngk@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 Amanda Maxemchuk, [maxemchuka@battelle.org](mailto:maxemchuka@battelle.org), no later than September 18, 2013, 10 pm ET.**

**Independent External Peer Review of the  
San Antonio Channel Improvement Project  
General Re-Evaluation Report and Integrated Environmental Assessment  
Westside Creeks Ecosystem Restoration  
San Antonio, Texas**

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

General

1. Were all models used in the analyses used in an appropriate manner?
2. Are the models used sufficiently discriminatory to support the conclusions drawn from them (i.e. identify meaningful differences between alternatives)?
3. Were risk and uncertainty sufficiently considered?
4. In your opinion, are there sufficient analyses upon which to base the recommendation?

Problem, Needs, Constraints, and Opportunities

5. Are the problems, needs, constraints, and opportunities adequately and correctly defined?
6. Do the identified problems, needs, constraints, and opportunities reflect a ecosystem approach, addressing a geographic area large enough to ensure that plans address the cause and effect relationships among affected resources and activities that are pertinent to achieving the study objectives; i.e., evaluate the resources and related demands as a system.
7. Existing and Future Without Project Resources.
8. Has the character and scope of the study area been adequately described and is the identified study area appropriate in terms of undertaking a systems investigation?
9. Do you agree with the general analyses of the existing social, financial, and natural resources within the study area?
10. For your particular area of expertise, provide an in-depth review of whether the analyses of the existing social, financial, and natural resources within the project area are sufficient to support the estimation of impacts of the array of alternatives.
11. Given your area of expertise, does this section appropriately address the existing conditions of all resources pertinent to the study?

12. Were there surveys conducted to evaluate the existing social, financial, and natural resources adequate? If not, what types of surveys should have been conducted?
13. Were socioeconomic conditions adequately addressed? Were specific socioeconomic issues not addressed?
14. Was the hydrology discussion sufficient to characterize current baseline conditions and to allow for evaluation of how forecasted conditions (with and without proposed actions) are likely to affect hydrologic conditions. Please comment on the completeness of the discussion on the relationship between subsurface hydrology and the hydrodynamics of the project area.
15. Was the discussion of natural resources sufficient to characterize current baseline conditions and to allow for evaluation of forecasted conditions (with and without proposed actions)?
16. Were the assumptions used as the basis for developing the most probable future without project conditions reasonable? Were adequate scenarios effectively considered (applied during analyses where relevant and/or reasonably investigated)? Were the potential effects of climate change addressed?
17. Are the future conditions expected to exist in the absence of a Federal project logical and adequately described and documented?
18. Please comment on the conclusion of the most probable future without project condition. Do you envision other potential probable outcomes?

#### Plan Formulation / Evaluation

19. Was a reasonably complete array of possible measures considered in the development of alternatives?
20. Does each alternative meet the formulation criteria of being effective, efficient, complete and acceptable?
21. Were the assumptions made for use in developing the future with project conditions for each alternative reasonable? Were adequate scenarios considered? Were the assumptions reasonably consistent across the range of alternatives and/or adequately justified where different?

22. Are the changes between the without and with project conditions adequately described for each alternative?
23. Are the uncertainties inherent in our evaluation of benefits, costs, and impacts, and any risk associated with those uncertainties, adequately addressed and described for each alternative?
24. Are future Operation, Maintenance, Repair, Replacement, and Rehabilitation efforts adequately described and are the estimated cost of those efforts reasonable for each alternative?
25. Please comment on the screening of the proposed alternatives. Are the screening criteria appropriate? In your professional opinion are the results of the screening acceptable? Were any measures or alternatives screened out too early?

#### Recommended Plan

26. Comment on whether you agree or disagree with how the selected alternative was formulated and selected. Comment on the plan formulation. Does it meet the study objectives and avoid violating the study constraints?
27. Are there any unmitigated environmental impacts not identified and if so could they impact plan selection?
28. Please comment on the likelihood of the recommended plan to achieve the expected outputs.
29. Please comment on the completeness of the recommended plan, i.e. will any additional efforts, measures, or projects be needed to realize the expected benefits?
30. Please comment on the appropriateness of location, sizing and design of plan features.

#### Ecosystem Restoration

31. Are the expected changes in the quality and abundance of desired ecological resources clearly and precisely specified in justifying the ecosystem restoration investment?
32. Is the significance of the sought ecological resources clearly determined by institutionalized national goals?
33. Is the scarcity of the sought ecological resources characterized in terms of national significance?

34. Is the distinctiveness of the sought ecological resources quality indicated (are there closely related resources that substitute in most respects)?
35. Are forecast changes in sought ecological resource quality quantified so as to indicate achievement of national goals?
36. Is it clear that restoration of the desired ecological resource quality is a function of improvements in habitat quality or quantity?
37. Do planning models and procedures clearly link habitat improvement to the needs of the targeted ecological resources?
38. Do planning models and procedures adequately consider and provide for limiting factors beyond quality and quantity of habitat?
39. Is it clear that the restored ecological resource quality will be sustainable over the long run?
40. Are the risks facing successful restoration of sustainable ecological resource quality clearly shown to be managed and any residual risks identified in terms of:
  - a. Sufficient geophysical support (hydrology and geomorphology)?
  - b. Sufficient environmental chemistry?
  - c. Sufficient biological support (e.g., food, habitat and systems-stabilizing species)?
  - d. Changes in climate and in the influential ecoregion (e.g. major land use changes)?
41. Are the required long-term commitments (both Federal and non-Federal) to sustaining the restored ecological resource quality adequately described and adequately demonstrated?

#### Summary Questions

42. Please identify the most critical concerns (up to 5) 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.
43. Please provide positive feedback on the project and/or review documents.