

# Final Independent External Peer Review Report Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft Detailed Project Report/Environmental Assessment



Prepared by  
Battelle Memorial Institute

Prepared for  
Department of the Army  
U.S. Army Corps of Engineers  
National Planning Center of Expertise for Ecosystem Restoration  
Mississippi Valley Division

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## Executive Summary

### PROJECT BACKGROUND AND PURPOSE

The purpose of the Springville Dam Great Lakes Restoration Initiative project is to evaluate an array of measures which will provide fish passage above the dam to the upstream reaches of Cattaraugus Creek and its tributaries while at the same time prohibiting upstream migration of sea lampreys. The project is currently in the feasibility phase. The dam cannot just be breached as it is presently an effective barrier to invasive sea lamprey migration to upstream spawning habitat. Sea lampreys have had an enormous negative impact on the Great Lakes ecosystem.

The approximately 34-mile reach of Cattaraugus Creek between Springville Dam and Lake Erie provides important spawning areas for a number of Lake Erie fish species, including several native and high-value naturalized fish species. Due to the presence of the 40-foot-high, 338-foot-long Springville Dam, fish species are blocked from gaining access to approximately 70 miles of high-quality spawning waters upstream of the dam. Significant populations of native and high-value naturalized fish species are anticipated to develop in areas upstream of the dam if connectivity is restored. Other negative effects of this impoundment include altered sediment transport dynamics and loss of riverine hydraulics. These disturbances have resulted in a decline of fish, mussel, and macroinvertebrate species richness and abundance as inferred from a comparison of above-dam vs. below-dam conditions.

The decision document for this project is the Draft Detailed Project Report/Environmental Assessment (DPR/EA). The decision document summarizes baseline existing conditions in the study area. It also describes and discusses the likely array of alternative plans, including their benefits, costs, and environmental effects and outputs. That document identifies, evaluates, and recommends a solution (the Preferred Action Alternative) that best meets the planning objectives of comprehensive habitat restoration through the study area.

The Preferred Action Alternative consists of breaching Springville Dam, constructing a new sea lamprey barrier within the breach, and constructing a fish passage system to allow fish species to access approximately 70 miles of high-quality habitat located upstream of the dam. The proposed plan is anticipated to have large benefits to Cattaraugus Creek aquatic life by restoring connectivity between the upper and lower watershed. Several native and highly valued naturalized fish species, not currently present above the dam, are expected to expand their range with access to the high-quality habitat above the dam, thus increasing species richness. The fish communities above and below the dam are also expected to increase in richness and abundance and thus benefit from the restored connectivity. In addition, the proposed plan will restore approximately two-thirds of the existing dam pool to riverine

habitat. This will benefit both native and high-value naturalized fish species. The total first cost for implementation of the Preferred Action Alternative is \$4,376,414. The period of analysis used to compute costs is 50 years using a fiscal year 2013 Federal interest rate of 3.75 percent.

## Independent External Peer Review Process

Because of the dam's life safety hazard designation, Engineer Circular (EC) 1165-2-214 requires that a Type I IEPR be completed for the Springville Dam Draft DPR/EA. Independent; objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. The U.S. Army Corps of Engineers (USACE) is conducting an Independent External Peer Review (IEPR) of the Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft DPR/EA (hereinafter: Springville Dam IEPR). As a 501(c)(3) non-profit science and technology organization, Battelle is independent, is free from conflicts of interest (COIs), and meets the requirements for an Outside Eligible Organization (OEO) per guidance described in USACE (2012). Battelle has experience in establishing and administering peer review panels for USACE and was engaged to coordinate the IEPR of the Springville Dam. The IEPR was external to the agency and conducted following USACE and Office of Management and Budget (OMB) guidance described in USACE (2012) and OMB (2004). This final report presents the Final Panel Comments of the IEPR Panel (the Panel). Details regarding the IEPR (including the process for selecting panel members, the panel members' biographical information and expertise, and the charge submitted to the Panel to guide its review) are presented in appendices.

Based on the technical content of the Springville Dam review documents and the overall scope of the project, Battelle identified candidates for the Panel in the following key technical areas: civil engineering/dam safety and hydraulic and hydrologic (H&H) engineering. USACE was given the list of candidate panel members, but Battelle selected the final two members of the Panel.

The Panel received an electronic version of the 1,105-page Springville Dam review document, 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. This charge included two questions added by Battelle that sought summary information from the IEPR Panel.

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

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

## Results of the Independent External Peer Review

The panel members agreed on their “assessment of the adequacy and acceptability of the ...engineering methods, models, and analyses used” (USACE, 2012; p. D-4) in the Springville Dam IEPR review documents. Table ES-1 lists the Final Panel Comment statements by level of significance. The full text of the Final Panel Comments is presented in Section 4.2 of this report. The following summarizes the Panel’s findings.

Based on the Panel’s review, the Springville Dam review documents are well-written and concise. The DPR/EA addresses most of the important technical project issues in a practical, easily understood, and logical manner. In general, the models and assumptions used in the analyses are sound and applied in an appropriate manner to support the conclusions drawn from them. While the Panel believes that many technical aspects of the engineering and dam safety issues of the Springville Dam project are reasonable and presented clearly, the Panel identified some elements of the DPR/EA where additional documentation and clarification is warranted.

**Hydraulic/Hydrologic (H&H) Engineering:** The H&H-related dam safety issues with the existing dam are well-described, including the dam-break analysis conducted by others prior to this study. Existing dam safety issues have largely been removed, and it is highly likely that failure of the new lamprey barrier will not result in a floodwave of sufficient magnitude to create a dam safety issue. The Panel’s most significant finding is that the potential hazards and safety issues created by a submerged hydraulic jump occurring immediately downstream of the proposed lamprey barrier may have not been evaluated. The Panel is concerned that the proposed lamprey barrier, which will be constructed between the two remaining sections of the existing dam spillway, will create a low head dam that may have a submerged hydraulic jump/roller immediately downstream under certain flow and tailwater conditions. This issue can be addressed by adding a discussion of the results of any reviews or analyses of the potential for a submerged hydraulic jump to occur and the resultant risk to the public. If reviews or analyses have not been done, there should be a review of the potential of a submerged hydraulic jump occurring and whether the lamprey barrier can be designed to prevent both a submerged jump from occurring and lamprey passage as part of the early stages of the Preconstruction Engineering and Design (PED). Also, it is not clear to the Panel whether the H&H conditions for the preferred alternative have been evaluated. The potential downstream flooding risks associated with a potential failure of the proposed lamprey barrier are not expected to affect the selection of the preferred alternative; however, the residual risk needs to be defined and any appropriate additional actions should be implemented. The Panel believes this issue can be addressed by performing appropriate H&H analyses, including dam-break and inundation mapping, for the post-construction condition in order to evaluate downstream flood risk as part of PED, and incorporate the results of the H&H analysis in final design stability and seepage analyses in accordance with NYSDEC and USACE dam safety requirements.

**Civil Engineering/Dam Safety:** While the primary objective of the project is ecological restoration, the benefits from a dam safety perspective are also very positive. Reducing the normal pool approximately 20 feet significantly reduces the consequences of failure, as well as the probability of most potential failure modes. The potential restoration measures presented adequately address the current dam safety issues of the existing dam. The Panel acknowledges that the DPR/EA is a feasibility-level document, but is somewhat concerned that the anticipated construction process and related issues may raise the risk level of the preferred alternative if not appropriately considered. This issue can be addressed by discussing the anticipated construction sequencing, methods, and significant construction-related considerations in the

DPR/EA. The formulation and selection of Alternative 2B appears appropriate from a dam safety perspective; however, that this preferred solution will be safer is largely inferred and not explicitly stated. While the Panel agrees that the removal of the dam spillway results in a significant reduction in the remaining risk to public safety, there appears to be an underlying assumption that the residual risk is very small. The Panel believes this issue can be addressed by clarifying the differences in dam safety risk between the with-project and without-project conditions, and quantifying risk reduction and residual risk as part of the PED.

**Table ES-1. Overview of Nine Final Panel Comments Identified by the Springville Dam IEPR Panel**

No.	Final Panel Comment
<b>Medium/High Priority</b>	
1	The potential hazards and safety issues created by a submerged hydraulic jump occurring immediately downstream of the proposed lamprey barrier may have not been evaluated.
<b>Medium Priority</b>	
2	Construction considerations that may impact the implementation of the preferred alternative are not discussed.
<b>Medium/Low Priority</b>	
3	The potential impacts, including expected risk reduction and residual risk, of removing the middle section of the existing dam spillway and replacing it with a lamprey barrier, have not been adequately presented or quantified.
4	The H&H analyses to determine impoundment levels for the post-construction condition are not presented.
5	The potential impact of sediment deposition downstream of the dam following dam removal and lamprey barrier construction has not been documented.
6	The potential effects of climate change and how they might affect the final design are not specifically addressed.
7	Documentation of future design issues to consider during PED is not included in the DPR/EA.
8	The potential for the occurrence of headcutting during the transition period from the time of dam removal until the time when the sediment regime returns to its natural condition has not been discussed.
<b>Low Priority</b>	
9	The assumption that all alternatives, not just the preferred alternative (Alternative 2B), may see increases from their original scoping costs has not been clearly supported.

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## LIST OF ACRONYMS

<b>ATR</b>	Agency Technical Review
<b>COI</b>	Conflict of Interest
<b>DPR/EA</b>	Detailed Project Report/Environmental Assessment
<b>DrChecks</b>	Design Review and Checking System
<b>EC</b>	Engineer Circular
<b>ER</b>	Engineer Regulation
<b>ERDC</b>	Engineer Research and Development Center
<b>FRM</b>	Flood risk management
<b>H&amp;H</b>	Hydraulics and hydrology
<b>IEPR</b>	Independent External Peer Review
<b>O&amp;M</b>	Operation and maintenance
<b>OEO</b>	Outside Eligible Organization
<b>OMB</b>	Office of Management and Budget
<b>PDT</b>	Project Delivery Team
<b>PED</b>	Preconstruction Engineering and Design
<b>USACE</b>	United States Army Corps of Engineers
<b>USFWS</b>	United States Fish and Wildlife Services
<b>WRDA</b>	Water Resources Development Act

## 1. INTRODUCTION

The purpose of the Springville Dam Great Lakes Restoration Initiative project is to evaluate an array of measures which will provide fish passage above the dam to the upstream reaches of Cattaraugus Creek and its tributaries while at the same time prohibiting upstream migration of sea lampreys. The project is currently in the feasibility phase. The dam cannot just be breached as it is presently an effective barrier to invasive sea lamprey migration to upstream spawning habitat. Sea lampreys have had an enormous negative impact on the Great Lakes ecosystem.

The approximately 34-mile reach of Cattaraugus Creek between Springville Dam and Lake Erie provides important spawning areas for a number of Lake Erie fish species, including several native and high-value naturalized fish species. Due to the presence of the 40-foot-high, 338-foot-long Springville Dam, fish species are blocked from gaining access to approximately 70 miles of high-quality spawning waters upstream of the dam. Significant populations of native and high-value naturalized fish species are anticipated to develop in areas upstream of the dam if connectivity is restored. Other negative effects of this impoundment include altered sediment transport dynamics and loss of riverine hydraulics. These disturbances have resulted in a decline of fish, mussel, and macroinvertebrate species richness and abundance as inferred from a comparison of above-dam vs. below-dam conditions.

The decision document for this project is the Draft Detailed Project Report/Environmental Assessment (DPR/EA). The decision document summarizes baseline existing conditions in the study area. It also describes and discusses the likely array of alternative plans, including their benefits, costs, and environmental effects and outputs. The document identifies, evaluates, and recommends a solution (the Preferred Action Alternative) that best meets the planning objectives of comprehensive habitat restoration through the study area.

The Preferred Action Alternative consists of breaching Springville Dam, constructing a new sea lamprey barrier within the breach, and constructing a fish passage system to allow fish species to access approximately 70 miles of high-quality habitat located upstream of the dam. The proposed plan is anticipated to have large benefits to Cattaraugus Creek aquatic life by restoring connectivity between the upper and lower watershed. Several native and highly valued naturalized fish species, not currently present above the dam, are expected to expand their range with access to the high-quality habitat above the dam, thus increasing species richness. The fish communities above and below the dam are also expected to increase in richness and abundance and thus benefit from the restored connectivity. In addition, the proposed plan will restore approximately two-thirds of the existing dam pool to riverine habitat. This will benefit both native and high-value naturalized fish species. The total first cost for implementation of the Preferred Action Alternative is \$4,376,414. The period of analysis used to compute costs is 50 years using a fiscal year 2013 Federal interest rate of 3.75 percent.

Because of the dam's life safety hazard designation, Engineer Circular (EC) 1165-2-214 requires that a Type I IEPR be completed for the Springville Dam DPR/EA. Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. The objective of the work described here was to conduct an Independent External Peer Review (IEPR) of the Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft DPR/EA (hereinafter: Springville Dam IEPR) in accordance with procedures described in the Department of the Army, U.S. Army Corps of Engineers (USACE), Engineer Circular (EC) *Civil Works Review* (EC 1165-2-214) (USACE, 2012) and the Office of Management and Budget (OMB) bulletin *Final Information Quality Bulletin for Peer Review* (OMB, 2004). Supplemental guidance on evaluation for conflicts of interest (COIs) was obtained from the *Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports* (The National Academies, 2003).

This final report presents the Final Panel Comments of the IEPR Panel (the Panel) on the existing engineering analyses contained in the Springville Dam review documents (Section 4). Appendix A describes in detail how the IEPR was planned and conducted. Appendix B provides biographical information on the IEPR panel members and describes the method Battelle followed to select them. Appendix C presents the final charge to the IEPR panel members for their use during the review; the final charge was submitted to USACE on March 13, 2014.

## 2. PURPOSE OF THE IEPR

To ensure that USACE documents are supported by the best scientific and technical information, USACE has implemented a peer review process that uses IEPR to complement the Agency Technical Review (ATR), as described in USACE (2012).

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

In this case, the IEPR of the Springville Dam was conducted and managed using contract support from Battelle, which is an Outside Eligible Organization (OEO) (as defined by EC 1165-2-214). Battelle, a 501(c)(3) organization under the U.S. Internal Revenue Code, has experience conducting IEPRs for USACE.

## 3. METHODS FOR CONDUCTING THE IEPR

The methods used to conduct the IEPR are briefly described in this section; a detailed description can be found in Appendix A. Table 1 presents the major milestones and deliverables of the Springville Dam IEPR. Due dates for milestones and deliverables are based on the award/effective date of February 4, 2014. Note that the work items listed under Task 6 occur after the submission of this report. Battelle anticipates submitting the pdf printout of the USACE's Design Review and Checking System (DrChecks) project file (the final deliverable) on June 5, 2014. The actual date for contract end will depend on the date that all activities for this IEPR are conducted.

**Table 1. Major Milestones and Deliverables of the Springville Dam IEPR**

Task	Action	Due Date
1	Award/Effective Date	2/4/2014
	Review documents available <sup>a</sup>	2/25/2014
2	Battelle submits list of selected panel members	2/21/2014
	USACE confirms the panel members have no COI	2/25/2014
3	Battelle convenes kick-off meeting with USACE	2/27/2014
	Battelle convenes kick-off meeting with USACE and panel members	3/13/2014
4	Panel members complete their individual reviews	3/26/2014
	Panel members provide draft Final Panel Comments to Battelle	4/7/2014
5	Battelle submits Final IEPR Report to USACE	4/18/2014
6 <sup>b</sup>	Battelle convenes Comment-Response Teleconference with panel members and USACE	5/13/2014
	Battelle submits pdf printout of DrChecks project file to USACE	6/5/2014
	Contract End/Delivery Date	2/4/2015

<sup>a</sup>The project start was delayed until the review documents became available.

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

Battelle identified, screened, and selected two panel members to participate in the IEPR based on their expertise in the following disciplines: civil engineering/dam safety and hydraulic and hydrologic (H&H) engineering. The Panel reviewed the Springville Dam IEPR documents and produced nine Final Panel Comments in response to 19 charge questions provided by USACE for the review. This charge included two questions added by Battelle that seek summary information from the IEPR Panel. Battelle instructed the Panel to develop the Final Panel Comments using a standardized four-part structure:

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

Battelle reviewed all Final Panel Comments for accuracy, adherence to USACE guidance (EC 1165-2-214, Appendix D), and completeness prior to determining that they were final and suitable for inclusion in the Final IEPR Report. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The Panel's findings are summarized in Section 4.1; the Final Panel Comments are presented in full in Section 4.2.

## 4. RESULTS OF THE IEPR

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

### 4.1 Summary of Final Panel Comments

The panel members agreed on their "assessment of the adequacy and acceptability of the ... engineering methods, models, and analyses used" (USACE, 2012; p. D-4) in the Springville Dam review documents. The full text of the Final Panel Comments is presented in Section 4.2 of this report, by level of significance. The following summarizes the Panel's findings.

Based on the Panel's review, the Springville Dam review documents are well-written and concise. The DPR/EA addresses most of the important technical project issues in a practical, easily understood, and logical manner. In general, the models and assumptions used in the analyses are sound and applied in an appropriate manner to support the conclusions drawn from them. While the Panel believes that many technical aspects of the engineering and dam safety issues of the Springville Dam project are reasonable and presented clearly, the Panel identified some elements of the DPR/EA where additional documentation and clarification is warranted.

**Hydraulic/Hydrologic (H&H) Engineering:** The H&H-related dam safety issues with the existing dam are well-described, including the dam-break analysis conducted by others prior to this study. Existing dam safety issues have largely been removed, and it is highly likely that failure of the new lamprey barrier will not result in a floodwave of sufficient magnitude to create a dam safety issue. The Panel's most significant finding is that the potential hazards and safety issues created by a submerged hydraulic jump occurring immediately downstream of the proposed lamprey barrier may have not been evaluated. The Panel is concerned that the proposed lamprey barrier, which will be constructed between the two remaining sections of the existing dam spillway, will create a low head dam that may have a submerged hydraulic jump/roller immediately downstream under certain flow and tailwater conditions. This issue can be addressed by adding a discussion of the results of any reviews or analyses of the potential for a submerged hydraulic jump to occur and the resultant risk to the public. If reviews or analyses have not been done, there should be a review of the potential of a submerged hydraulic jump occurring and whether the lamprey barrier can be designed to prevent both a submerged jump from occurring and lamprey passage as part of the early stages of the Preconstruction Engineering and Design (PED). Also, it is not clear to the Panel whether the H&H conditions for the preferred alternative have been evaluated. The potential downstream flooding risks associated with a potential failure of the proposed lamprey barrier are not expected to affect the selection of the preferred alternative; however, the residual risk needs to be defined and any appropriate additional actions should be implemented. The Panel believes this issue can be addressed by performing appropriate H&H analyses, including dam-break and inundation mapping, for the post-construction condition in order to evaluate downstream flood risk as part of PED, and incorporate the results of the H&H analysis in final design stability and seepage analyses in accordance with NYSDEC and USACE dam safety requirements.

**Civil Engineering/Dam Safety:** While the primary objective of the project is ecological restoration, the benefits from a dam safety perspective are also very positive. Reducing the normal pool approximately 20 feet significantly reduces the consequences of failure, as well as the probability of most potential failure modes. The potential restoration measures presented adequately address the current dam safety issues of the existing dam. The Panel acknowledges that the DPR/EA is a feasibility-level document, but is

somewhat concerned that the anticipated construction process and related issues may raise the risk level of the preferred alternative if not appropriately considered. This issue can be addressed by discussing the anticipated construction sequencing, methods, and significant construction-related considerations in the DPR/EA. The formulation and selection of Alternative 2B appears appropriate from a dam safety perspective; however, that this preferred solution will be safer is largely inferred and not explicitly stated. While the Panel agrees that the removal of the dam spillway results in a significant reduction in the remaining risk to public safety, there appears to be an underlying assumption that the residual risk is very small. The Panel believes this issue can be addressed by clarifying the differences in dam safety risk between the with-project and without-project conditions, and quantifying risk reduction and residual risk as part of the PED.

## 4.2 Final Panel Comments

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

### Final Panel Comment 1

**The potential hazards and safety issues created by a submerged hydraulic jump occurring immediately downstream of the proposed lamprey barrier may have not been evaluated.**

#### Basis for Comment

In the preferred plan (Alternative 2B), a portion of the concrete dam spillway will be removed and replaced with a new lamprey barrier and fish passage channel. The existing dam spillway will remain in place to provide structural support, and the middle section of the existing dam spillway will be removed to the existing streambed elevation prior to installing the lamprey barrier.

The Cattaraugus Creek is currently used for a variety of recreational activities, and the proposed project will return the creek to a more natural state and create additional fish habitat, both of which will likely lead to increased recreational use in the future. The Panel is concerned that the proposed lamprey barrier, which will be constructed between the two remaining sections of the existing dam spillway, will create a low head dam that may have a submerged hydraulic jump/roller immediately downstream under certain flow and tailwater conditions. The review documents do not discuss the possibility that individuals tubing, rafting, canoeing, or fishing the Cattaraugus Creek could become trapped in the submerged hydraulic jump/roller immediately downstream of the barrier and drown. It is not clear from the review documents whether the submerged hydraulic jump potential was evaluated and found not to be a concern, or if it was not evaluated.

The submerged hydraulic jump downstream of the lamprey barrier may only occur for a relatively short period of time during tailwater conditions created by higher than average discharge. However, its occurrence may coincide with a higher than average number of recreational users on the Cattaraugus Creek due to the more dynamic flow conditions, which intrinsically increases risk to the public. The interim period during which sediment previously deposited in the dam is redistributed downstream may create creek conditions that are even more intriguing to those wanting to use the Cattaraugus Creek for recreational purposes further increasing the potential population of recreational users at risk. Given that there were more than 190 documented drownings between 1970 and 2010 including more than 100 between 2000 and 2010 at low head dams (Tschantz et al., 2011 and BYU) throughout the United States, it is important to consider the impacts posed by the lamprey barrier and confirm that they do not increase

risk to the general public.

### Significance – Medium/High

A submerged hydraulic jump downstream of the lamprey barrier may be design-dependent and may occur only during higher than average discharge conditions that create tailwater conditions suitable for its occurrence, but the potential for its occurrence and the risk to the public need to be evaluated and discussed.

### Recommendations for Resolution

1. Add to the DPR/EA a discussion of the results of any reviews or analyses of the potential for a submerged hydraulic jump to occur and the resultant risk to the public if the information is available.
2. If reviews or analyses have not been completed, review the potential of a submerged hydraulic jump occurring and whether the lamprey barrier can be designed to prevent both a submerged jump from occurring and lamprey passage as part of the early stages of the PED.
3. If Recommendation 2 is the path being followed, add a short statement to the DPR/EA clarifying that future analyses will be undertaken later in the design process to assess the potential for the occurrence of a submerged hydraulic jump and the risks posed to the public.

### Literature Cited:

Tschantz, B.A., and K.R. Wright (2011). Hidden dangers and public safety at low-head dams. The Journal of Dam Safety, 9:1, 2011. ISSN 194409836 – Association of State Dam Safety Officials. [http://www.damsafety.org/media/Documents/Journal/TschantzWright\\_PublicSftyLowDams\\_JDS2011\\_1.pdf](http://www.damsafety.org/media/Documents/Journal/TschantzWright_PublicSftyLowDams_JDS2011_1.pdf)

BYU (no date). Location of Fatalities at Submerged Hydraulic Jumps. Brigham Young University incident reporting website. Kern, E. and R.H. Hotchkiss, Ira A. Fulton College of Engineering and Technology. <http://krcproject.groups.et.byu.net/browse.php>

## Final Panel Comment 2

**Construction considerations that may impact the implementation of the preferred alternative are not discussed.**

### Basis for Comment

The Panel acknowledges that the DPR/EA is a feasibility-level document, but believes that construction issues may impact the implementation of the preferred alternative. The following issues are not discussed in the DPR/EA, but their consideration may benefit the anticipated construction process.

1. Dewatering and temporary water control structures will be required to allow construction within Cattaraugus Creek. Water control measures can have significant impacts, risks, and costs. For example, the Panel expects that minimum flows in Cattaraugus Creek will be required for environmental purposes at all times during construction of the lamprey barrier and fish passage system. Water control structures, such as coffer dams, may limit flow, impound water, and create a temporary risk to life downstream, and must be designed to withstand minimum flows as well as flood flows during construction. Contract documents (i.e., construction plans and specifications) should address this risk.
2. The timing of construction and the time-of-year restrictions for work in Cattaraugus Creek are important considerations. Including this information may provide a better understanding of the constructability of the project.
3. The upstream slopes of either the existing embankments or the proposed dredge area could suddenly slump into lowered Cattaraugus Creek during a flood event thereby creating unanticipated consequences. This potential should be considered for final design and construction.

### Significance – Medium

The anticipated construction process and related issues may raise the risk level of the preferred alternative if not appropriately considered.

### Recommendations for Resolution

1. Discuss the anticipated construction sequencing, methods, and significant construction-related considerations in the DPR/EA.
2. If not already considered (as it was for Alternatives 3 and 4), evaluate using the bottom portion of the existing spillway as the lamprey barrier so as to minimize the water control and dewatering required during construction.

### Final Panel Comment 3

**The potential impacts, including expected risk reduction and residual risk, of removing the middle section of the existing dam spillway and replacing it with a lamprey barrier, have not been adequately presented or quantified.**

#### Basis for Comment

The DPR/EA does not identify specific potential impacts on risk reduction due to removing the dam and replacing it with a newly constructed lamprey barrier (i.e., the with-project condition). It notes that lowering the pool by 20 feet as compared to the without project condition, to a differential head condition of approximately 8 feet greatly reduces risk. The low head dam/lamprey barrier could still fail, albeit likely with less severe consequences.

While the Panel agrees that the removal of the dam spillway results in a significant reduction of the remaining risk, there appears to be an underlying assumption that the residual risk is very small. The Panel notes that DPR/EA Section 3.8 contains general comments regarding dam safety for Alternatives 3 and 4, but not for Alternatives 2A and 2B (the preferred alternative). The Panel concurs that the dam safety risk associated with dam failure is likely greater for Alternatives 3 and 4 than for Alternatives 2A and 2B. However, given that some portions of the dam will remain intact, the DPR/EA should address the level of risk reduction and residual risk, be it large, small, or non-existent, for Alternatives 2A and 2B. There is no summary in the DPR/EA of the residual risk for each alternative, which would clarify any risk associated with all the different alternatives and serve to verify that future risks were considered for all alternatives.

#### Significance – Medium/Low

Although the risk reduction impacts of removing the dam may be obvious, the Panel is not able to determine the specific level of reduction, which is important from the standpoint of potential dam safety.

#### Recommendations for Resolution

1. Clarify in the DPR/EA the differences in dam safety risk between the with-project and without-project conditions.
2. Quantify risk reduction and residual risk as part of the PED to further illustrate how the selected alternative meets the objective of restoring the natural hydrologic function to the Cattaraugus Creek, as well as the changes to the nature and level of risk to the public obtained by selecting the chosen alternative.

#### Final Panel Comment 4

**The H&H analyses to determine impoundment levels for the post-construction condition are not presented.**

#### Basis for Comment

It is not clear to the Panel whether the H&H conditions for the preferred alternative have been evaluated. The post-construction impoundment and tailwater levels, particularly during the design storms for the final Hazard Rating, are required input parameters for final seepage and stability design analyses per NYSDEC (Part 673.13) and USACE dam safety standards.

The post-construction impoundment levels are also required to assess the risk associated with a potential failure of the proposed lamprey barrier and appurtenant structures. If the impoundment level warrants, this risk should be evaluated by typical “Fair Weather” and “Wet Weather” dam-break modeling and mapping of the resulting downstream inundation area. If, based on the inundation mapping, the post-construction condition (i.e., once the preferred alternative is constructed) is found to result in significant risk to downstream populations, then appropriate actions addressing this risk should be implemented and communicated to the affected population through an Emergency Action Plan (NYSDEC Part 673.7) or similar.

#### Significance – Medium/Low

The potential downstream flooding risks associated with a potential failure of the proposed lamprey barrier are not expected to affect the selection of the preferred alternative; however, the residual risk needs to be defined and any appropriate additional actions should be implemented.

#### Recommendations for Resolution

1. Perform H&H analyses, potentially including dam-break and inundation mapping, for the post-construction condition in order to evaluate downstream flood risk as part of PED. Also, include a summary of findings and a discussion of associated risk in the PED documentation. Document any concerns and future H&H analyses to be undertaken in the PED, in the DPR/EA.
2. Incorporate results of the H&H analysis in final design stability and seepage analyses in accordance with NYSDEC and USACE dam safety requirements during PED. Add a statement to the DPR/EA that studies will be conducted as part of the PED.

## Final Panel Comment 5

**The potential impact of sediment deposition downstream of the dam following dam removal and lamprey barrier construction has not been documented.**

### Basis for Comment

As noted in Section 5.2 of Appendix 7: Supplemental Report, 7-C Analysis of Sediment Transport Following Removal of Springville Dam, the movement of sediment downstream from the dam following its removal will raise the bed elevation and increase the 100-year flood elevation downstream. The increase in bed elevation could impact downstream structures.

Computational modeling resulted in several conclusions, presented in the Executive Summary, among them, “The sediment delivered from the reservoir may substantially impact the channel reach one mile below the dam after dam removal. The risk of flooding may increase due to downstream sediment deposits reducing channel capacity.” Also, “The reservoir will continue delivering sediment downstream 10 years after the removal of the dam. Model results indicate that sedimentation in the channel below the dam may increase the risk of flooding.”

The DPR/EA does not indicate whether increased flooding risk had been reviewed, whether any negative impacts on existing structures had been identified, or whether the potential impacts due to increased bed elevation downstream had been reviewed.

### Significance – Medium/Low

The impact of sediment deposition downstream noted in the supplemental material should be incorporated in the DPR/EA to acknowledge that the impacts have been considered and to verify their relevance (positive, negative, neutral) to the project.

### Recommendations for Resolution

1. Describe in the DPR/EA whether a review of increased bed elevations downstream of the dam and their impact on the flooding risk has been conducted, and whether any negative impacts on structures have been identified.
2. If the impact of sediment deposition has been reviewed, document any causes for concern for any structures, and the probable duration of the increase in bed elevation if it is expected to be temporary.
3. If the impact of sediment deposition has not been reviewed, add a note that an assessment of the potential impacts of sediment deposition downstream of the dam will be addressed during the future PED process.

## Final Panel Comment 6

**The potential effects of climate change and how they might affect the final design are not specifically addressed.**

### Basis for Comment

The Panel did not find documentation indicating that the effects of climate change had been addressed in the DPR/EA. USACE has developed a governance structure to support mainstreaming adaptation by establishing an overarching USACE *Climate Change Adaptation Policy Statement and a Climate Change Adaptation Steering Council*. This policy requires USACE to mainstream climate change adaptation in all activities to help enhance the resilience of our built and natural water-resource infrastructure and reduce its potential vulnerabilities to the effects of climate change and variability (USACE, 2012b).

From a dam safety perspective, increased storm frequency and rainfall intensity should be considered in the H&H analyses required for the final design.

### Significance – Medium/Low

The potential effects of climate change, such as increased storm frequency and rainfall intensity, should be accounted for in the PED.

### Recommendations for Resolution

1. Account for increased storm frequency and rainfall intensity in establishing H&H input to the final design.
2. Add a statement indicating the potential effects of climate change, such as increased rainfall intensity, and how they will be considered in the final design in the DPR/EA.

### Literature Cited:

USACE (2012b). Climate Change Adaptation Plan and Report. U.S. Army Corps of Engineers. June 2012.

## Final Panel Comment 7

**Documentation of future design issues to consider during PED is not included in the DPR/EA.**

### Basis for Comment

The Panel understands that the DPR/EA is a feasibility-level study and that it would be premature to address all design concerns at this time. However, in addition to some of the more important issues raised elsewhere, such as the potential formation of a hydraulic jump/roller and consideration of using the lower portion of the existing spillway as the lamprey barrier to mitigate construction concerns, the Panel presents the following issues for future consideration:

1. The lowering of the water surface upstream of the dam may expose other hazards, such as access to the turbine intakes, and other items associated with those portions of the dam that are to remain in place.
2. There are no subsurface data available for the existing dam embankments and rock foundation; available information is limited to surficial observations and regional information. Subsurface investigations of the embankments and the bedrock foundation should be performed as part of the final design.
3. Properties obtained from the subsurface investigations as well as the results of future H&H studies should be used for stability analyses of the lamprey barrier in accordance with NYSDEC (Part 673.13) and USACE dam safety standards.
4. The Panel understands that the spillway and the core walls of the embankments extend to bedrock and that there have been no significant seepage issues at the existing dam with a significantly higher pool. Therefore, seepage is not expected to be a dam safety concern for the preferred alternative. However, seepage has been observed between the intake and the downstream side of the powerhouse and at the downstream end of the left training wall. In addition, the Bergman 2010 Final Summary Memorandum noted that a sinkhole had occurred adjacent to the old concrete intake.

### Significance – Medium/Low

Final design considerations are not expected to affect selection or ultimate performance of the preferred alternative, but documentation would help verify future design plans.

### Recommendations for Resolution

1. Consider addressing bullets 1 through 4 above, and potentially other final design considerations, in Section 6.1 of the DPR/EA.
2. Provide the above information to the design team for their consideration during PED.

## Final Panel Comment 8

**The potential for the occurrence of headcutting during the transition period from the time of dam removal until the time when the sediment regime returns to its natural condition has not been discussed.**

### Basis for Comment

During the transition period from the time of dam removal until the time when the sediment regime returns to its natural condition, periodic headcutting of the channel bed may occur upstream of the dam, creating localized hazards and safety issues for the public. These hazards and safety issues have not been addressed in the DPR/EA.

The Panel understands that the complex interaction between the flowing water and the different layers and types of sediment affects the formation of headcuts, making it difficult to complete an analysis of the potential for headcutting. Therefore, the Panel would find acceptable an analysis that uses justifiable simplifications, such as a sensitivity analysis of headcut formation using different assumed sediment profiles based on available information, instead of collecting additional data. This analysis could be completed as part of a later phase in the design and analysis process.

### Significance – Medium/Low

There may only be a small risk that headcutting of the channel bed is sufficiently deep to create bed features and flow patterns hazardous to rafters, canoeists, tubers, and fishers; however, a residual risk remains.

### Recommendation for Resolution

1. Analyze the potential for headcutting to occur, including the probable vertical drop across the cut and whether the drop is a potential risk. Include a note in the DPR/EA if this type of analysis is planned for the PED stage of the project.

## Final Panel Comment 9

**The assumption that all alternatives, not just the preferred alternative (Alternative 2B), may see increases from their original scoping costs has not been clearly supported.**

### Basis for Comment

The Panel observed that additional cost engineering was performed for the preferred alternative (Alternative 2B), and indicated a significant increase from the original scoping costs. Similar analyses were not performed for the remaining alternatives.

During the March 19 mid-review teleconference (facilitated by Battelle) with the Panel and USACE, USACE indicated that they assumed all scenarios would see similar cost increases. While this may be a reasonable assumption and the choice of the preferred alternative may not change, this assumption is not clearly supported in the DPR/EA. A statement as to how significantly costs for the other alternatives would need to change in order to make an alternative other than 2B the preferred selection may explain the reasonableness of the assumption as well.

### Significance – Low

While the Panel agrees that the assumption is reasonable, a clear explanation of the assumption would improve understanding of the potential for another alternative to become the preferred alternative if additional cost engineering is conducted for the remaining alternatives.

### Recommendation for Resolution

1. Add a statement to explain and document the reasonableness of the assumption (i.e., that all alternatives may see similar cost increases) and assurance as to why the preferred alternative is not likely to change if a cost engineering analysis were to be performed for each of the alternatives.

## 5. REFERENCES

BYU (no date). Location of Fatalities at Submerged Hydraulic Jumps. Brigham Young University incident reporting website. Kern, E. and R.H. Hotchkiss, Ira A. Fulton College of Engineering and Technology. <http://krcproject.groups.et.byu.net/browse.php>

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

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

Tschantz, B.A., and K.R. Wright (2011). Hidden dangers and public safety at low-head dams. The Journal of Dam Safety, 9:1, 2011. ISSN 194409836 – Association of State Dam Safety Officials. [http://www.damsafety.org/media/Documents/Journal/TschantzWright\\_PublicSftyLowDams\\_JDS2011\\_1.pdf](http://www.damsafety.org/media/Documents/Journal/TschantzWright_PublicSftyLowDams_JDS2011_1.pdf)

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

USACE (2012b). Climate Change Adaptation Plan and Report. U.S. Army Corps of Engineers. June 2012.

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# APPENDIX A

Process for the Springville Dam IEPR

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

Table A-1 presents the schedule followed in executing the Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft Detailed Project Report/Environmental Assessment (DPR/EA) Independent External Peer Review (hereinafter: Springville Dam IEPR). Due dates for milestones and deliverables are based on the award/effective date of February 4, 2014. The review documents were provided by the U.S. Army Corps of Engineers (USACE) on February 25, 2014. Note that the work items listed under Task 6 occur after the submission of this report. Battelle will enter the nine Final Panel Comments developed by the Panel into USACE's Design Review and Checking System (DrChecks), a Web-based software system for documenting and sharing comments on reports and design documents, so that USACE can review and respond to them. USACE will provide responses (Evaluator Responses) to the Final Panel Comments, and the Panel will respond (BackCheck Responses) to the Evaluator Responses. All USACE and Panel responses will be documented by Battelle. Battelle will provide USACE and the Panel a pdf printout of all DrChecks entries, through comment closeout, as a final deliverable and record of the IEPR results.

**Table A-1. Springville Dam Complete IEPR Schedule**

Task	Action	Due Date
1	Award/Effective Date	2/4/2014
	Review documents available	2/25/2014
	Battelle submits draft Work Plan <sup>a</sup>	3/6/2014
	USACE provides comments on draft Work Plan	3/13/2014
	Battelle submits final Work Plan <sup>a</sup>	3/13/2014
2	Battelle requests input from USACE on the conflict of interest (COI) questionnaire	2/8/2014
	USACE provides comments on COI questionnaire	2/14/2014
	Battelle submits list of selected panel members <sup>a</sup>	2/21/2014
	USACE confirms the panel members have no COI	2/25/2014
	Battelle completes subcontracts for panel members	3/10/2014
3	Battelle convenes kick-off meeting with USACE	2/27/2014
	Battelle sends review documents to panel members	3/11/2014
	Battelle convenes kick-off meeting with panel members	3/13/2014
	Battelle convenes kick-off meeting with USACE and panel members	3/13/2014
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	3/19/2014
4	Panel members complete their individual reviews	3/26/2014
	Battelle provides panel members with talking points for Panel Review Teleconference	3/28/2014

**Table A-1. Springville Dam Complete IEPR Schedule (continued)**

Task	Action	Due Date	
	Battelle convenes Panel Review Teleconference	3/28/2014	
	Battelle provides Final Panel Comment templates and instructions to panel members	3/31/2014	
	Panel members provide draft Final Panel Comments to Battelle	4/7/2014	
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	4/7-15/2014	
	Panel finalizes Final Panel Comments	4/15/2014	
<b>5</b>	Battelle provides Final IEPR Report to panel members for review	4/16/2014	
	Panel members provide comments on Final IEPR Report	4/17/2014	
	Battelle submits Final IEPR Report to USACE <sup>a</sup>	4/18/2014	
<b>6<sup>b</sup></b>	Battelle inputs Final Panel Comments to the DrChecks and provides Final Panel Comment response template to USACE	4/22/2014	
	Battelle convenes teleconference with USACE to review the Post-Final Panel Comment Response Process	4/22/2014	
	Battelle convenes teleconference with Panel to review the Post-Final Panel Comment Response Process	4/22/2014	
	USACE provides draft Project Delivery Team (PDT) Evaluator Responses to Battelle	5/2/2014	
	Battelle provides the panel members the draft PDT Evaluator Responses	5/6/2014	
	Panel members provide Battelle with draft BackCheck Responses	5/9/2014	
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	5/9/2014	
	Battelle convenes Comment-Response Teleconference with panel members and USACE	5/13/2014	
	USACE inputs final PDT Evaluator Responses to DrChecks	5/28/2014	
	Battelle provides final PDT Evaluator Responses to panel members	5/29/2014	
	Panel members provide Battelle with final BackCheck Responses	6/3/2014	
	Battelle inputs the Panel's final BackCheck Responses in DrChecks	6/4/2014	
	Battelle submits pdf printout of DrChecks project file <sup>a</sup>	6/5/2014	
		Contract End/Delivery Date	2/4/2015

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

At the beginning of the Period of Performance for the Springville Dam IEPR, Battelle held a kick-off meeting with USACE to review the preliminary/suggested schedule, discuss the IEPR process, and address any questions regarding the scope (e.g., clarify expertise areas needed for panel members). Any revisions to the schedule were submitted as part of the final Work Plan. In addition, 17 charge questions were provided by USACE and included in the draft and final Work Plans. Battelle added two questions that seek summary information from the IEPR Panel. The final charge also included general guidance for the Panel on the conduct of the peer review (provided in Appendix C of this final report).

Prior to beginning their review and within three days of their subcontracts being finalized, both 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 Springville Dam IEPR 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.

- **Springville Dam Great Lakes Fisheries and Ecosystem Restoration (GLFER) Detailed Project Report/Environmental Assessment (DPR/EA) (109 pages)**
- **Appendix 1 – Engineering (12 pages)**
- **Appendix 2 – Real Estate Plan<sup>1</sup> (10 pages)**
- **Appendix 3 – Cost Engineering<sup>1</sup> (150 pages)**
- **Appendix 4 – Environmental<sup>1</sup> (347 pages)**
- **Appendix 5 – Cost Effectiveness and Incremental Cost Analysis (CE/ICA) (7 pages)<sup>1</sup>**
- **Appendix 6 – Letter of Intent (4 pages)**
- **Appendix 7 – Supplemental Reports (466 pages)**
- 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.

About halfway through the review of the Springville Dam IEPR 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 eight panel member questions to USACE. USACE was able to provide responses to all of the questions prior to and during the teleconference.

In addition, throughout the review period, USACE provided documents at the request of panel members. These documents were provided to Battelle and then sent to the Panel as additional information only and

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<sup>1</sup> Although listed as review documents, there were no panel members with specific expertise required to review them. The panel members limited their comments to those in their field of expertise, but the entire document was made available for their review.

were not part of the official review. A list of these additional documents requested by the Panel is provided below.

- USACE, Phase I Inspection Report, National Dam Safety Program (1981)
- New York State Department of Environmental Conservation Dam Safety Section (2013).

## A.2 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. At the end of the review, Battelle summarized the individual comments in a preliminary list of 11 overall comments and discussion points. Each panel member's individual comments were shared with the full Panel in a merged individual comments table.

## A.3 IEPR Panel Teleconference

Battelle facilitated a three-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 significant importance to the findings, and merged any related individual comments. At the conclusion of the teleconference, Battelle reviewed each Final Panel Comment with the Panel, including the associated level of significance, and confirmed the lead author for each comment.

The Panel also discussed a response to one specific charge question where there appeared to be disagreement between panel members. The conflicting comment was resolved based on the professional judgment of the Panel and determined not to be conflicting.

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

## A.4 Preparation of Final Panel Comments

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

- **Lead Responsibility:** For each Final Panel Comment, one Panel member was identified as the lead author responsible for coordinating the development of the Final Panel Comment and submitting it to Battelle. Battelle modified lead assignments at the direction of the Panel. To assist each lead in the development of the Final Panel Comments, Battelle distributed the merged individual comments table, a summary detailing each draft final comment statement, an example Final Panel Comment following the four-part structure described below, and templates for the preparation of each Final Panel Comment.

- Directive to the Lead: Each lead was encouraged to communicate directly with the other panel member as needed and to contribute to a particular Final Panel Comment. If a significant comment was identified that was not covered by one of the original Final Panel Comments, the appropriate lead was instructed to draft a new Final Panel Comment.
- Format for Final Panel Comments: Each Final Panel Comment was presented as part of a four-part structure:
  1. Comment Statement (succinct summary statement of concern)
  2. Basis for Comment (details regarding the concern)
  3. Significance (high, medium/high, medium, medium/low, and low; see description below)
  4. Recommendation(s) for Resolution (see description below).
- Criteria for Significance: The following were used as criteria for assigning a significance level to each Final Panel Comment:
  1. **High:** Describes a fundamental issue with the project that affects the current recommendation or justification of the project, and which will affect its future success, if the project moves forward without the issue being addressed. Comments rated as high indicate that the Panel determined that the current methods, models, and/or analyses contain a “showstopper” issue.
  2. **Medium/High:** Describes a potential fundamental issue with the project, which has not been evaluated at a level appropriate to this stage in the Planning process. Comments rated as medium/high indicate that the Panel analyzed or assessed the methods, models, and/or analyses available at this stage in the Planning Process and has determined that if the issue is not addressed, it could lead to a “showstopper” issue.
  3. **Medium:** Describes an issue with the project, which does not align with the currently assessed level of risk assigned at this stage in the Planning process. Comments rated as medium indicate that, based on the information provided, the Panel identified an issue that would raise the risk level if the issue is not appropriately addressed.
  4. **Medium/Low:** Affects the completeness of the report at this time in describing the project, but will not affect the recommendation or justification of the project. Comments rated as medium/low indicate that the Panel does not currently have sufficient information to analyze or assess the methods, models, or analyses.
  5. **Low:** Affects the understanding or accuracy of the project as described in the report, but will not affect the recommendation or justification of the project. Comments rated as low indicate that the Panel identified information that was mislabeled or incorrect or that certain data or report section(s) were not clearly described or presented.
- Guidelines for Developing Recommendations: The recommendation section was to include specific actions that USACE should consider to resolve the Final Panel Comment (e.g., suggestions on how and where to incorporate data into the analysis, how and where to address insufficiencies, areas where additional documentation is needed).

Battelle reviewed and edited the Final Panel Comments for clarity, consistency with the comment statement, and adherence to guidance on the Panel’s overall charge, which included ensuring that there were no comments regarding either the appropriateness of the selected alternative or USACE policy. At the end of this process, nine Final Panel Comments were prepared and assembled. There was no direct

communication between the Panel and USACE during the preparation of the Final Panel Comments. The Final Panel Comments are presented in the main report.

# APPENDIX B

Identification and Selection of Panel Members  
for the Springville Dam IEPR

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## B.1 Panel Identification

The candidates for the Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft Detailed Project Report/Environmental Assessment (hereinafter: Springville Dam IEPR) Panel were evaluated based on their technical expertise in the following key areas: civil engineering/dam safety and hydraulic and hydrologic (H&H) engineering. These areas correspond to the technical content of the Springville Dam review documents and overall scope of the Springville Dam project.

To identify candidate panel members, Battelle reviewed the credentials of the experts in Battelle's Peer Reviewer Database, sought recommendations from colleagues, contacted former panel members, and conducted targeted Internet searches. Battelle evaluated these candidate panel members in terms of their technical expertise and potential conflicts of interest (COIs). Of these candidates, Battelle chose the most qualified individuals, confirmed their interest and availability, and ultimately selected two experts for the final Panel.

The two 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>2</sup> These COI questions serve as a means of disclosure and to better characterize a candidate's employment history and background. Providing a positive response to a COI screening question did not automatically preclude a candidate from serving on the Panel. For example, participation in previous USACE technical peer review committees and other technical review panel experience was included as a COI screening question. A positive response to this question could be considered a benefit.

- Previous and/or current involvement by you or your firm<sup>3</sup> in the Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft DPR/EA.
- Previous and/or current involvement by you or your firm<sup>3</sup> with flood risk management, ecosystem restoration or dam safety in or around Cattaraugus Creek, Lake Erie, or near the Village of Springville, Erie County, New York.
- Previous and/or current involvement by you or your firm<sup>3</sup> in the Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, DPR/EA-related projects.
- Previous and/or current involvement by you or your firm<sup>3</sup> in the conceptual or actual design, construction, or operation and maintenance (O&M) of any projects in the Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft DPR/EA-related projects.
- Current employment by the U.S. Army Corps of Engineers (USACE).

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<sup>2</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>3</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.

- Previous and/or current involvement with paid or unpaid expert testimony related to Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft DPR/EA.
- Previous and/or current employment or affiliation with members of the cooperating agencies or local sponsors: New York State Department of Environmental Conservation or the Great Lakes Restoration Initiative Program (for pay or pro bono).
- Past, current, or future interests or involvements (financial or otherwise) by you, your spouse, or your children in or around Cattaraugus Creek, Lake Erie, or near the Village of Springville, Erie County, New York.
- Current personal involvement with other USACE projects, including whether involvement was to author any manuals or guidance documents for USACE. If yes, provide titles of documents or description of project, dates, and location (USACE district, division, Headquarters, Engineer Research and Development Center [ERDC], etc.), and position/role. Please highlight and discuss in greater detail any projects that are specifically with the Buffalo District.
- Previous or current involvement with the development or testing of models that will be used for or in support of the Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft DPR/EA.
- Current firm<sup>3</sup> involvement with other USACE projects, specifically those projects/contracts that are with the Buffalo 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 Buffalo District.
- Any previous employment by USACE as a direct employee, notably if employment was with the Buffalo District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
- Any previous employment by USACE as a contractor (either as an individual or through your firm<sup>3</sup>) within the last 10 years, notably if those projects/contracts are with the Buffalo 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 review, or flood management projects, and include the client/agency and duration of review (approximate dates).
- Pending, current, or future financial interests in Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft DPR/EA-related contracts/awards from USACE.
- A significant portion (i.e., greater than 50%) of personal or firm<sup>3</sup> revenues within the last 3 years came from USACE contracts.
- A significant portion (i.e., greater than 50%) of personal or firm<sup>3</sup> revenues within the last 3 years from contracts with the non-Federal sponsor (New York State Department of Environmental Conservation or the Great Lakes Restoration Initiative Program).
- Any publicly documented statement (including, for example, advocating for or discouraging against) related to Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft DPR/EA.
- Participation in relevant prior and/or current Federal studies relevant to this project and/or Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft DPR/EA.
- Previous and/or current participation in prior non-Federal studies relevant to this project and/or Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft DPR/EA.

- 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?

Other considerations:

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

## B.2 Panel Selection

In selecting the final members of the Panel, Battelle chose experts who best fit the expertise areas and had no COIs. Both of the final reviewers are affiliated with a consulting company. Battelle established subcontracts with the panel members when they indicated their willingness to participate and confirmed the absence of COIs through a signed COI form. USACE was given the list of candidate panel members, but Battelle selected the final Panel.

An overview of the credentials of the final two members of the Panel and their qualifications in relation to the technical evaluation criteria is presented in Table B-1. More detailed biographical information regarding each panel member and his area of technical expertise is presented in Section B.3.

**Table B-1. Springville Dam IEPR Panel: Technical Criteria and Areas of Expertise**

Technical Criterion	Bjarngard	Voigt
<b>Civil Engineering/Dam Safety</b>		
Registered Professional Engineer with a minimum 15 years engineering experience conducting and evaluating geotechnical and geologic analyses and evaluating risk assessments for dams and impoundments	X	
Experience in geotechnical evaluation of flood risk management (FRM) structures such as slope stability and seepage through earthen embankments	X	
Experience in geotechnical evaluation of FRM structures such as underseepage through the foundation of the FRM structures, including dam and levee embankments, floodwalls, closure structures and other pertinent features	X	
Experience with both deterministic and probabilistic methods of evaluation	X	
Experience with analysis of potential failure modes	X	
Experience with the Dam Safety program for both Federal and non-Federal projects	X	
Active participation in related professional societies	X	
<b>Hydrology and Hydraulic Engineering</b>		

Technical Criterion	Bjarngard	Voigt
Registered Professional Engineer with a minimum 15 years engineering experience in hydrologic and hydraulic engineering with an emphasis on the analysis and design of dams, including outlet works and spillways		X
Experience performing dam breach analyses		X
Experience performing dam safety analyses		X
Experience associated with FRM projects		X
Familiarity with USACE application of risk analysis for dam safety investigations		X

### B.3 Panel Member Qualifications

#### **Anders Bjarngard, P.E.**

**Role:** Civil engineering/dam safety expertise.

**Affiliation:** GZA GeoEnvironmental, Inc.

**Mr. Bjarngard**, a principal at GZA GeoEnvironmental, Inc., has 27 years of experience performing dam engineering on water supply embankment dams. He earned a M.S. in civil engineering (geotechnical) from Tufts University in 1983 and is a registered professional engineer in Massachusetts. His areas of expertise include dam safety inspections and investigations and subsurface investigations; foundation, lateral earth support, and dam rehabilitation; construction monitoring and documentation; slope stability and seepage and settlement analyses; preparation of plans, specifications, and contract documents; geologic and geotechnical field investigations; and laboratory and technical analyses including seepage and slope stability, final design, preparation of construction documents and construction observation. He is also experienced with both deterministic and probabilistic methods of evaluation.

Mr. Bjarngard has extensive experience in the geotechnical evaluation of FRM structures such as seepage through earthen embankments. Relevant studies include multiple New York City Catskill and Delaware District Dams as well as the City of Fitchburg Massachusetts Lovell Pond Dam, where a grout curtain was ultimately designed and constructed to mitigate seepage through the embankment dam. He is also experienced in the geotechnical evaluation of FRM structures including underseepage through the foundation of the FRM structures including dam and levee embankments, floodwalls, closure structures and other pertinent features. His experience evaluating underseepage in the foundations of floodwalls is reflected in such projects as the Accreditation of the City of Chicopee Massachusetts Flood Control Levees and Flood Walls, where he was responsible for extensive subsurface investigation, detailed seepage, slope stability and settlement analysis of earthen structures, and development of geotechnical recommendations for levee embankment, flood wall, and appurtenant structures.

Mr. Bjarngard is knowledgeable in the Dam Safety program for both Federal and non-Federal projects; is familiar with USACE Engineer Manuals and other USACE technical guidance as the basis of design for dam safety repairs, and is familiar with USACE dam safety assurance policy protocols. He has participated in other USACE dam safety peer reviews, including the Dam Safety Modification Report for

Addicks and Barker Dams, Texas. His extensive dam safety experience is reflected in such studies as the Emergency Inspections of High Hazard Dams in Middlesex County, Massachusetts and the Inspection and Evaluation of Dam Safety Program for 28 Privately-Owned Dams, Western Connecticut and Southeastern New York. He is also experienced in the analysis of potential failure modes and is a Federal Energy Regulatory Commission (FERC) approved Failure Mode Facilitator and has participated as a geotechnical team member and facilitated Potential Failure Mode Analyses (PFMAs) for state-owned dams.

Mr. Bjarngard is an active member of the U.S. Society on Dams and the Association of State Dam Safety Officials, for which organizations he has published numerous papers on dam safety, and the American Society of Civil Engineers.

### ***Richard Voigt, P.E.***

**Role:** Hydrology and hydraulic (H&H) engineering expertise.

**Affiliation:** Voigt Consultants, LLC

**Mr. Voigt** is the President of Voigt Consultants, LLC in South St. Paul, Minnesota, and is a registered professional engineer in Minnesota and Wisconsin. He earned his M.S. in civil engineering/water resource engineering from the University of Minnesota in 1985 and has 29 years of experience in hydraulic engineering and hydrology, specializing in the fields of dam and water resources engineering and complex hydraulic analyses and modeling. Much of his project experience is focused in the areas of hydropower, dams and spillways, numerical and physical hydraulic modeling, and hydrology and includes using 1-, 2- and 3-dimensional models to evaluate flow patterns in rivers and near dams, spillways, and inlet and outlet structures.

Mr. Voigt has worked on a number of projects and studies of dam breach and related dam safety analyses. Relevant studies include assessment modeling of breach formation and propagation in an area of vegetated natural soils that functions as an emergency spillway at the Cheboygan Dam in Michigan; breach analysis to evaluate the water surface elevations created by the failure of Sylvan Dam, Minnesota; and evaluation of spillway alternatives to increase the capacity of Pillager Dam to meet the Inflow Design Flood. He has also been involved with flood risk management studies as both project manager and hydrology and hydraulic engineer. As the hydraulic engineer for the flood study of the Whiteface River in northeastern Minnesota, he evaluated the potential to reduce downstream flooding through adjustments to the present summer target water surface elevation and the adaptive management of winter water surface elevations of Whiteface Reservoir. The study incorporated the needs for flood storage with the needs for water storage for power production and the needs to maintain water levels suitable for fish habitat and recreational use, along with maintaining the freeboard necessary to prevent dam overtopping.

Mr. Voigt is familiar with USACE application of risk analysis for dam safety investigations. He was an active participant in the PFMA for the Lower St. Anthony Falls Hydroelectric Project and he recently served as the facilitator for a Supplemental PFMA of the design of repair alternatives to the Brainerd Dam. He also attended the first phase of Risk Informed Decision Making training conducted by the FERC in December 2012. More recently, he was selected as the H&H engineer on the IEPR of the Supplemental Major Rehabilitation Evaluation Report for Center Hill Dam, Caney Fork River, DeKalb County, Tennessee.

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# APPENDIX C

Final Charge to the Panel  
as Submitted to USACE on March 13, 2014  
for the Springville Dam IEPR

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# **CHARGE QUESTIONS AND GUIDANCE TO THE PANEL MEMBERS FOR THE IEPR OF THE CATTARAUGUS Creek Watershed Ecosystem RESTORATION AT SPRINGVILLE DAM, DRAFT DETAILED PROJECT REPORT/ENVIRONMENTAL ASSESSMENT**

## **BACKGROUND**

The purpose of the Springville Dam Great Lakes Restoration Initiative project is to evaluate an array of measures which will provide fish passage above the dam to the upstream reaches of Cattaraugus Creek and its tributaries while at the same time prohibiting upstream migration of sea lampreys. The project is currently in the feasibility phase. The dam cannot just be breached as it is presently an effective barrier to invasive sea lamprey migration to upstream spawning habitat. Sea lampreys have had an enormous negative impact on the Great Lakes ecosystem.

The approximately 34-mile reach of Cattaraugus Creek between Springville Dam and Lake Erie provides important spawning areas for a number of Lake Erie fish species, including several native and high-value naturalized fish species. Due to the presence of the 40-foot-high, 338-foot-long Springville Dam, fish species are blocked from gaining access to approximately 70 miles of high-quality spawning waters upstream of the dam. Significant populations of native and high-value naturalized fish species are anticipated to develop in areas upstream of the dam if connectivity is restored. Other negative effects of this impoundment include altered sediment transport dynamics and loss of riverine hydraulics. These disturbances have resulted in a decline of fish, mussel, and macroinvertebrate species richness and abundance as inferred from a comparison of above-dam vs. below-dam conditions.

The decision document for this project is the integrated Draft Detailed Project Report/Environmental Assessment (DPR/EA). The decision document summarizes baseline existing conditions in the study area. It also describes and discusses the likely array of alternative plans, including their benefits, costs, and environmental effects and outputs. That document identifies, evaluates, and recommends a solution (the Preferred Action Alternative) that best meets the planning objectives of comprehensive habitat restoration through the study area.

The Preferred Action Alternative consists of breaching Springville Dam, constructing a new sea lamprey barrier within the breach, and constructing a fish passage system to allow fish species to access approximately 70 miles of high-quality habitat located upstream of the dam. The proposed plan is anticipated to have large benefits to Cattaraugus Creek aquatic life by restoring connectivity between the upper and lower watershed. Several native and highly valued naturalized fish species, not currently present above the dam, are expected to expand their range with access to the high-quality habitat above the dam, thus increasing species richness. The fish communities above and below the dam are also expected to increase in richness and abundance and thus benefit from the restored connectivity. In addition, the proposed plan will restore approximately two-thirds of the existing dam pool to riverine habitat. This will benefit both native and high-value naturalized fish species. The total first cost for

implementation of the Preferred Action Alternative is \$4,376,414. The period of analysis used to compute costs is 50 years using a fiscal year 2013 Federal interest rate of 3.75 percent.

## OBJECTIVES

Because of the dam's life safety hazard designation, Engineer Circular (EC) 1165-2-214 requires that a Type I IEPR be completed for the DPR/EA. The objective of this work is to conduct an independent external peer review (IEPR) of the Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft DPR/EA (hereinafter: Springville Dam IEPR) in accordance with the Department of the Army, U.S. Army Corps of Engineers (USACE), Water Resources Policies and Authorities' *Civil Works Review* (EC 1165-2-214, 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 Springville Dam 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 civil engineering, dam safety, and hydraulic and hydrologic (H&H) 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:

Review Documents	
Title	Number of Pages
Springville Dam Great Lakes Fisheries and Ecosystem Restoration (GLFER) Detailed Project Report/Environmental Assessment (DPR/EA)	109
Appendix 1 – Engineering	12
Appendix 2 – Real Estate Plan*	10
Appendix 3 – Cost Engineering*	150
Appendix 4 – Environmental*	347
Appendix 5 – Cost Effectiveness and Incremental Cost Analysis (CE/ICA)*	7
Appendix 6 – Letter of Intent	4
Appendix 7 – Supplemental Reports	466
<b>Total Pages</b>	<b>1,105</b>

\* Although listed as review documents, there will be no panel members with specific expertise required to review them. The panel members will limit their comments to those in their field of expertise, but the entire document will be made available for their review should they choose.

## Documents for Reference

- 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*, December 16, 2004.

## SCHEDULE

This final schedule is based on the February 25, 2014, receipt of the final review documents.

Task	Action	Due Date
<b>Conduct Peer Review</b>	Battelle sends review documents to panel members	3/11/2014
	Battelle convenes kick-off meeting with panel members	3/13/2014
	Battelle convenes kick-off meeting with USACE and panel members	3/13/2014
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	3/19/2014
	Panel members complete their individual reviews	3/26/2014
<b>Prepare Final Panel Comments and</b>	Battelle provides panel members with talking points for Panel Review Teleconference	3/28/2014
	Battelle convenes Panel Review Teleconference	3/28/2014

Task	Action	Due Date
<b>Final IEPR Report</b>	Battelle provides Final Panel Comment templates and instructions to panel members	3/31/2014
	Panel members provide draft Final Panel Comments to Battelle	4/7/2014
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	4/7 to 4/15
	Panel finalizes Final Panel Comments	4/15/2014
	Battelle provides Final IEPR Report to panel members for review	4/16/2014
	Panel members provide comments on Final IEPR Report	4/17/2014
	Battelle submits Final IEPR Report to USACE*	4/18/2014
<b>Comment/Response Process</b>	Battelle inputs Final Panel Comments to DrChecks and provides Final Panel Comment response template to USACE	4/22/2014
	Battelle convenes teleconference with Panel to review the Post-Final Panel Comment Response Process	4/22/2014
	USACE provides draft Project Delivery Team (PDT) Evaluator Responses to Battelle	5/2/2014
	Battelle provides the panel members the draft PDT Evaluator Responses	5/6/2014
	Panel members provide Battelle with draft BackCheck Responses	5/9/2014
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	5/12/2014
	Battelle convenes Comment-Response Teleconference with panel members and USACE	5/13/2014
	USACE inputs final PDT Evaluator Responses to DrChecks	5/28/2014
	Battelle provides final PDT Evaluator Responses to panel members	5/29/2014
	Panel members provide Battelle with final BackCheck Responses	6/3/2014
	Battelle inputs the panel members' final BackCheck Responses to DrChecks	6/4/2014
Battelle submits pdf printout of DrChecks project file*	6/5/2014	

\*Deliverables

## CHARGE FOR PEER REVIEW

Members of this IEPR Panel are asked to determine whether the technical approach and scientific rationale presented in the Springville Dam review documents are credible and whether the conclusions are valid. The Panel is asked to determine whether the technical work is adequate, competently performed, and properly documented; satisfies established quality requirements; and yields scientifically credible conclusions. The Panel is being asked to provide feedback on the engineering/dam safety issues. 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 Springville Dam review 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 (Rachel Sell, [sellr@battelle.org](mailto:sellr@battelle.org)) or Program Manager (Karen Johnson-Young ([johnson-youngk@battelle.org](mailto:johnson-youngk@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 Rachel Sell, [sellr@battelle.org](mailto:sellr@battelle.org), no later than March 26, 2014, 10 pm ET.

# IEPR of the Cattaraugus Creek Watershed Ecosystem Restoration at Springville Dam, Draft Detailed Project Report/Environmental Assessment

## CHARGE QUESTIONS AND RELEVANT SECTIONS AS SUPPLIED BY USACE

### EXISTING CONDITIONS

1. Has the current condition of the existing dam been clearly described?
2. Please comment on whether all dam safety issues with the existing dam have been sufficiently identified and described.

### PLAN FORMULATION

3. 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?
4. Are the future conditions expected to exist in the absence of a Federal project logical and adequately described and documented?
5. With respect to dam safety and life safety, 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?
6. Please comment on whether the potential restoration measures presented adequately address the current dam safety issues of the existing dam.
7. Please comment on whether all potential restoration measures with respect to resolving existing dam safety issues have been identified.
8. Are the changes between the without- and with-project conditions, with respect to dam safety and life safety, adequately described for each alternative?
9. Have the potential impacts of each alternative been clearly and adequately presented, including expected risk reduction, residual risk, changes in existing outputs of the project, potential mitigation, and implementation schedules and costs (as related to dam safety)?
10. Only with respect to dam safety: Comment on whether you agree or disagree with how the selected alternative (Alternative 2B) was formulated and selected. Comment on the plan formulation. Does it meet the study objectives and avoid violating the study constraints?

## **DESCRIPTION OF THE PREFERRED PLAN**

11. In your expert opinion, does the preferred alternative (Alternative 2B) result in any significant threats to human life either during construction or after construction?
12. Are any existing dam safety residual risks adequately described, and is there a sufficient plan for communicating the residual risk to affected populations?
13. Has the condition of the dam (including the design and construction of the dam and appurtenant features, project maintenance, previous rehabilitations and dam safety modifications, and the dam's performance over time) been clearly described?
14. In your expert opinion, does the preferred alternative (Alternative 2B) result in any significant dam safety issues either during construction or after construction?
15. Based on your experience, are there any other USACE, Federal Emergency Management Agency, or New York State Department of Environmental Conservation performance or dam safety concerns that are not currently considered and addressed, but should be?
16. Based on your experience, will the preferred alternative, once constructed, improve the current safety and protection of the public? Why or why not?

## **GENERAL**

17. In your expert opinion, is there sufficient information in the Detailed Project Report to support the recommendation of the preferred alternative (Alternative 2B) with respect to dam safety issues?

## **OVERVIEW QUESTIONS AS SUPPLIED BY BATTELLE**

18. Please identify the most critical concerns (up to five) you have with the project and/or review documents.
19. Please provide positive feedback on the project and/or review documents.

