

DRAFT
RECORD OF DECISION
BLUESTONE DAM SAFETY MODIFICATION
HINTON, WEST VIRGINIA

SYNOPSIS

The National Dam Safety Act (Public Law [PL] 92-367) of August 1978 and Section 1203 of the Water Resources Development Act of 1986 (PL 99-662) authorized the U.S. Army Corps of Engineers (USACE) to review and modify its projects for dam safety. The Dam Safety Assurance Program provides for modification of completed USACE dams and related facilities when deemed necessary for safety purposes due to new hydrologic or seismic data or changes in the state-of-the-art design or construction criteria. The Bluestone Dam is eligible for modification in accordance with the policy presented in Engineering Regulation (ER) 1110-2-1156, Safety of Dam--Policy and Procedure.

The Proposed Action is to implement modifications to the existing stilling basin to prevent scour that could result in spillway monolith instability, and thus dam breach or failure, during extreme flood events. The purpose and need of the Proposed Action is to reduce incremental risk associated with dam failure to below the USACE tolerable risk guidelines in order to provide public safety to communities downstream of the dam and allow the dam to function as originally intended and authorized.

DECISION

It is my decision that the Bluestone Dam Safety Modification Project should be implemented as soon as practicable as a means to reduce risk to human populations, infrastructure and the natural environment below the Bluestone Dam at Hinton, West Virginia in the event of catastrophic events.

**FINDINGS OF THE FINAL SUPPLEMENTAL ENVIRONMENTAL
IMPACT STATEMENT**

1. The alternatives outlined in the Supplemental Final Environmental Impact Statement provide a suitable framework for the selection of measures to modify Bluestone Dam thereby significantly reducing risk to downstream resources in the event of extreme flooding.
2. Any significant deviations from the plan that subsequently may be determined to be necessary and advisable must be assessed to determine potential environmental, social and economic impacts by application of the National Environmental Policy Act process.

COMPARISON OF ALTERNATIVE PLANS

One structural alternative and a “No Action” alternative were advanced and considered in detail within the Supplemental Environmental Impact Statement to reduce the risk of failure of Bluestone Dam. The following is a summary of these two alternatives:

Alternative 1: Hydraulic Jump Basin with Supercavitating Baffles – This alternative is the tentatively selected plan (TSP) and includes the modification of the existing stilling basin system with a protective concrete apron overlay and larger baffles among other features described in the SFEIS. Modification to the dam would occur over an eight to ten year period. Alternative 1 would also include a remotely controlled crest gate operating system, as well as other non-structural risk management measures. This alternative assumes completion of the Phase 3 (completed February 2017) and Phase 4 (currently ongoing) of the 1998 Dam Safety Assurance Study (DSAS) approved project features.

Alternative 2: No Action Alternative – No modifications to address the risk assessment-identified safety concerns would be implemented. This alternative also assumes the completion of Phases 3 (completed February 2017) and Phase 4 (currently ongoing) of the 1998 DSAS approved project features. The installation of an additional 66 monolith multi-strand anchors which were not originally included in the Phase 4 construction contract would be completed as part of the No Action Alternative. The No Action Alternative would also include non-structural risk management measures.

While the two alternatives are similar in their potential to create certain moderate impacts on some resources during construction such as increased noise and reduced air quality, the alternatives differ in their potential to create other adverse impacts on the human and natural environment. Alternative 1 would cause significant adverse impacts to aquatic resources and downstream recreation during construction. The No Action Alternative has the potential to cause significant, long-term, adverse impacts to all area resources.

Because the No Action Alternative includes construction of certain risk reduction measures, it would continue to cause construction related impacts similar to those anticipated under Alternative 1, such as increased noise, reduction in enjoyment of recreation areas currently used for construction staging, and reduced local air quality.

The construction of TSP would cause additional construction related impacts over those experienced under the No Action Alternative. The noise and air quality impacts experienced under completion of Phase 3 and 4 would continue further into the future under the TSP, causing prolonged long-term but non-permanent adverse impacts to quality of life for nearby residents and recreational facilities. Additionally, the construction of a temporary cofferdam or causeway for stilling basin dewatering would have direct and indirect adverse impacts on downstream botanical, wildlife, water, and aquatic resources through clearing of riparian vegetation, disturbance of aquatic habitat, downstream flow alteration, and increased suspended solids that would not be caused under the No Action Alternative. The use of only eight of the sixteen sluice gates to pass water through the dam would result in upstream adverse impacts to these same resources by causing an

increase in the frequency, duration, and elevation of out of pool conditions within Bluestone Lake. This change in lake inundation would result in slightly increased sedimentation and vegetation stress. All of these impacts would be long-term given the eight to ten year construction duration of the TSP; however, most would be non-permanent. With the exception of the significant direct and indirect impacts to aquatic resources downstream of the dam due to construction and dewatering of the cofferdam/causeway, removal of the public fishing access downstream, and prolonged loss of downstream recreational areas on the left and right descending banks, the other upstream and downstream impacts range from negligible to moderate.

The construction of the TSP will cause moderate adverse long-term, non-permanent impacts to upstream recreation sites such as boat ramps and campgrounds, due to the increase in the frequency, duration, and elevation of out of pool conditions within Bluestone Lake. These impacts to recreation could impact the local recreation economy and community cohesion, as visitors could begin favoring other recreation sites over those impacted by the project.

The No Action Alternative however, leaves the dam in a condition in which the risk of dam failure is intolerable. Failure of the dam would result in long-term and significant impacts to the human and natural environment. While the No Action alternative includes construction of Phase 3 and 4 risk reduction measures, which would reduce the risk of dam failure to an extent, the risk of dam failure in the event of the PMF under the No Action alternative still exceeds tolerable risk levels and therefore has a higher risk than with the TSP.

Among numerous other impacts, dam failure would impact aquatic, wetland, terrestrial and riparian species, causing extreme scouring, destruction and mortality of plants, habitats and individuals. Significant sedimentation from mass flushing of Bluestone Lake and erosion during dam failure would lead to downstream sedimentation of benthic, aquatic and riparian habitat. Dam failure flooding would lead to decreased water quality, as areas inundated could release contaminants such as chemicals and pathogens.

Downstream recreation sites would be severely impacted, if not destroyed, and the inability to maintain pool elevations upstream of the dam would reduce the recreational opportunities afforded by Bluestone Lake. The socioeconomic impact and social effects of dam failure upstream and particularly downstream of the dam would be far more significant if the dam were to fail than the impacts experienced under the TSP.

In summary, while the No Action Alternative would have lesser near-term, construction-related impacts, it would not provide measures that reduce risk of dam failure to tolerable levels, and thus would leave the area's communities and environment at a far higher long-term risk of significant adverse impacts.

ALTERNATIVE SELECTION CONSIDERATIONS

As part of the project selection process, the environmental impacts of the TSP were considered and compared to the No Action Alternative. The project benefits were also considered. Modification made to the dam under the proposed action would mitigate downstream consequences of potential dam failure. The population at risk attributable to potential dam failure is estimated to be 165,000 people, and resulting downstream damage from failure of the dam is estimated to be over \$19 billion. Thus, the damages associated with dam failure far exceed the costs of the proposed action to modify the dam and reduce the risk of dam failure.

ENVIRONMENTAL CONSIDERATIONS IN THE SUPPLEMENTAL FINAL ENVIRONMENTAL IMPACT STATEMENT

Compliance with applicable environmental review and consultation requirements has been accomplished through the Supplemental Final Environmental Impact Statement processes. The project is in compliance with the Fish and Wildlife Service Coordination Act, Clean Water Act, Clean Air Act, Comprehensive Environmental Resource Compensation and Liability Act, Resource Conservation and Recovery Act, Toxic Substance Control Act, Endangered Species Act, Farmland Protection Policy Act, Floodplain Management (Executive Order 11988), National Environmental Policy Act, National Historic Preservation Act, and Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations (Executive Order 12898).

In addition to the Supplemental Final Environmental Impact Statement prepared for the selected plan, a Section 401 Water Quality Certification will be obtained from the West Virginia Department of Environmental Protection prior to commencement of construction. A Section 404 (b)(1) evaluation was prepared and is included as an appendix to the Final Environmental Impact Statement. Archeological and historical considerations have been addressed.

In addition, compliance with applicable provisions of Executive Order 11990, Protection of Wetlands, and Executive Order 11988, Floodplain Management, has been achieved. All practicable means to avoid or minimize environmental harm from the selected plan have been adopted.

In cooperation with resource agencies sufficient opportunities have been identified to achieve mitigation needed to offset significant aquatic and downstream recreational effects. However, a fully designed mitigation plan has not been completed prior to this Record of Decision. During the preconstruction engineering and design (PED) phase, the mitigation plan design and details shall be fully developed and will fully evaluate the benefits of the sites to appropriately compensate for the nine aquatic Habitat Units. It is anticipated a supplemental National Environmental Policy Act documents would be prepared documenting the mitigation site(s). In addition, due to significant downstream impacts to recreational resources, the USACE will develop detailed mitigation plans to replace lost recreational uses as discussed in this document to include a downstream

river access which will be in place prior to the initiation of construction and other features. All mitigation measures and commitments are outlined in Chapter 7.

CONCLUSIONS

I have reviewed and evaluated all documents concerning the Huntington District Engineer's recommendation, including the views of other interested agencies and the general public, and I have considered prevailing administrative policies and procedures. Based upon these factors, I find Alternative 1 - Hydraulic Jump Basin with Supercavitating Baffles as contained in the Dam Safety Modification Report and Supplemental Final Environmental Impact Statement is suitable for use as a plan for implementation of remedial modifications to Bluestone Dam, Hinton, West Virginia. I further conclude that the Bluestone Dam Safety Modification project should be implemented as soon as practicable.

Based on the conditions set forth in the Huntington District Engineer's findings and the added conditions set forth herein, I conclude that the public interest is best served by the decisions as set forth herein.