



DEPARTMENT OF THE ARMY
NORTH ATLANTIC DIVISION, US ARMY CORPS OF ENGINEERS
FORT HAMILTON MILITARY COMMUNITY
BROOKLYN, NEW YORK 11252-6700

REPLY TO
ATTENTION OF

DEC 11 2012

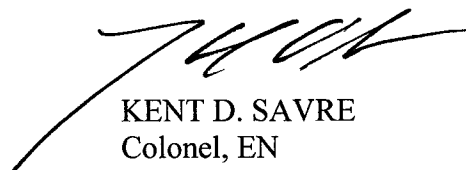
CENAD-PD-PP

MEMORANDUM FOR Commander, New England District, ATTN: CENAE-EP-PS

SUBJECT: Review Plan Approval for Blackstone River at Cumberland, Rhode Island Flood Risk Management Feasibility Study

1. The attached Review Plan for the subject study has been prepared in accordance with EC 1165-2-209, Civil Works Review Policy.
2. The Review Plan has been coordinated with the Flood Risk Management Planning Center of Expertise of the South Pacific Division, which is the lead office to execute this plan. For further information, contact Mr. Eric Thaut at 415-503-6852. The Review Plan does not include independent external peer review, as it was deemed not required by Headquarters, U.S. Army Corps of Engineers.
3. I hereby approve this Review Plan, which is subject to change as study circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to this Review Plan or its execution will require new written approval from this office.

Encl


KENT D. SAVRE
Colonel, EN
Commanding

REVIEW PLAN

Blackstone River at Cumberland, Rhode Island Flood Risk Management

Feasibility Study Report

U.S. Army Corps of Engineers New England District

MSC Approval Date: Pending

Last Revision Date: 26 November 2012



**US Army Corps
of Engineers®**

REVIEW PLAN

Blackstone River at Cumberland, Rhode Island Flood Risk Management Feasibility Study Report

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1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the Blackstone River at Cumberland, Rhode Island Flood Risk Management Feasibility Study.

b. References

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- (2) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011
- (3) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
- (4) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
- (5) Blackstone River FRM Feasibility Study PMP.
- (6) New England District Quality Management Plan

c. **Requirements.** This review plan was developed in accordance with EC 1165-2-209, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. In addition to these levels of review, decision documents are subject to cost engineering review and certification (per EC 1165-2-209) and planning model certification/approval (per EC 1105-2-412).

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for decision documents is typically either a Planning Center of Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. The RMO for the peer review effort described in this Review Plan is the Flood Risk Management Planning Center of Expertise.

The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies.

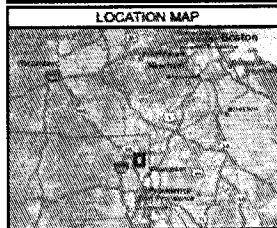
3. STUDY INFORMATION

a. **Decision Document.** The Blackstone River at Cumberland, Rhode Island Flood Risk Management Feasibility Study was authorized in a resolution approved by the Committee on Public Works of the United States Senate, dated September 12, 1969 (also known as the Southeastern New England (SENE) resolution). This resolution by the Committee on Public Works of the United States Senate gives the Army Corps of Engineers the authority to investigate solutions for "flood control, navigation, and related purposes in Southeastern New England ..." Funding to conduct the study was provided in a FY 2010 supplemental Appropriations bill. A Feasibility Cost Sharing Agreement was signed with the Rhode Island Department of Administration on October 4, 2011. The decision document to be prepared for this study is a Feasibility Report which will provide a

recommended plan for a flood risk management project for Cumberland, RI. The Feasibility Report will be approved at the Chief of Engineers level. Congressional authorization may be needed depending on the cost of the recommended plan. At this point in the study, it is anticipated that the flood risk management alternative may be implementable under the Corps' Section 205 continuing authority. In accordance with NEPA guidelines, an Environmental Assessment (EA) will be prepared. It is expected that the EA will result in the signing of a Finding of no Significant Impact (FONSI) at the District level

- b. Study/Project Description.** The U.S. Army Corps of Engineers, New England District, together with the Rhode Island Department of Administration, has initiated a \$600,000 Feasibility Study to evaluate flood risk management alternatives for the 80-acre Berkley Industrial Park located along the Blackstone River in Cumberland, Rhode Island. There are no single family homes, apartment buildings or any other type of residential property within the study area. Businesses in the Berkley Industrial Park have experienced numerous historical flooding events and most recent severe flood events in 2005 and again in 2010. The three primary businesses that are the focus of this study, which provide more than 450 jobs for the local economy, are: Hope Global, Okonite, and the Dean Warehouse facilities. This is a single-purpose study focusing only on flood risk management. Various structural and nonstructural alternatives to remediate flooding along this section of the Blackstone River will be investigated including the hydrological impacts of the dams located upstream and downstream of the project area. See Figure 1 for a site location.

Some potential structural alternatives that may be investigated include floodwalls, levees, diversion channels and pumps. Some potential nonstructural alternatives that could be investigated include emergency preparedness, flood proofing, and relocation. The selected Federally preferred alternative will contribute to the national economic development (NED), consistent with protecting the Nation's environment in accordance with national environmental statutes, applicable executive orders, and other Federal planning requirements. The approved 2008 reconnaissance report detailed two potential flood risk management alternatives which range in cost from \$2.9 to \$15 million.



**Blackstone River at Cumberland Rhode Island
Flood Risk Management Feasibility Study
Berkeley Industrial Park Study Area**

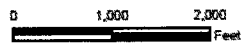


Figure 1. Blackstone River FRM feasibility study area

- c. **Factors Affecting the Scope and Level of Review.** The Berkeley Industrial park study area lies within the boundary of the Peterson Puritan USEPA Superfund site in Cumberland Rhode Island. Since 1997, the site has been in active remediation of a contaminated deep groundwater plume resulting from an industrial solvent spill in 1974. The groundwater contamination is not expected to pose an issue to the formulation and design of flood risk management alternatives. There is however a groundwater pumping system in place which pumps groundwater from an area surrounding the Hope Global building into the municipal sewer system. The New England District design team is aware of this system and the design objective as the study moves forward is to cause no permanent interruption or disturbance of the ongoing groundwater remediation of the Peterson Puritan superfund site.

A project risk which the study team is analyzing is the potential for undocumented soil contamination within the study area contained within the Peterson Puritan Superfund site. Preliminary coordination with the USEPA site RPM and the Rhode Island Department of Environmental Management has revealed a low level of concern for soil contamination. Contamination within the Peterson Puritan site is well-documented and is limited to groundwater contamination which is undergoing active remediation. There is a low level of risk that soil contamination will be discovered which could affect the design and implementation of flood risk management alternatives. If deemed necessary by the PDT, limited soil chemistry testing will likely be conducted as part of this feasibility study to confirm that soil contamination will not affect the formulation of flood risk management alternatives.

This project will not be justified by life safety and will not involve a significant threat to human life or safety. The study area is an industrial/commercial area. No residential housing is located within the immediate study area. The National Weather Service (NWS) office in Taunton, MA provides daily Blackstone River stage forecasts as well as flood forecasts and warnings to local communities and businesses. Project stakeholders are aware of the NWS systems and use them to prepare whenever there is a chance of flooding. During an extreme flood event it is anticipated that employees at the three businesses located within the industrial park could be evacuated quickly and safely to higher ground immediately adjacent to the study area. Evacuations of industrial properties are typically conducted rapidly and without the delays and challenges faced in residential areas. The Berkeley Industrial Park is also vacated most nights, weekends and holidays. Given the project's location in a small industrial park, there is a negligible chance that the proposed project would pose a significant threat to human life. Given the above factors, The New England District Chief of Engineering concurs with the PDT's assessment that this project does not pose a significant threat to human life.

The consequences of project non-performance on project economics, the environment, and social well-being, public safety and social justice for the Blackstone River FRM study will be limited. Preliminary economic analyses indicate that the three businesses within the study area will benefit by the reduction of flood induced damages to facilities within the Berkeley Industrial Park. Project non-performance could impact the three businesses, but would have no impact to other businesses, housing or residential areas. The environmental impacts from non-performance will be low since the study area is contained within a well established industrial park with very few opportunities for wildlife habitat. The social well being of the community will not likely be impacted due to project non-performance since the study area is within the confines of an industrial park, not within a community setting. Impacts to public safety and social justice will be limited for the same reason.

There has been no request from the Governor of Rhode Island for a study peer review by independent experts. Based on early public outreach meetings and written responses from a coordinated agency meeting and site visit held in January 2012, this study is not likely to involve significant public dispute as to the size, nature, or effects of the project. Flood risk management alternatives will be developed in full consideration of the comments provided to the PDT from project stakeholders. The Town of Cumberland and the State of Rhode Island are represented on the PDT and local and State officials are very supportive of the study.

The economic analysis is currently ongoing and the three affected businesses have been extremely cooperative in providing flood damage information to the Corps and allowing the PDT to visit the properties on several occasions. This study is not likely to involve significant public dispute as to the economic or environmental cost or benefit of the project.

The information presented in the decision document will not be based on novel methods or involve the use of innovative materials or techniques. The overall study has limited risks and will most likely be a very traditional flood risk management project. The study is considering both structural and non-structural flood risk management measures including flood proofing, relocation, increased channel conveyance, and flood barriers.

At this early stage of the study the PDT does not believe the study will present complex challenges for interpretation or require the need for precedent-setting methods or models. Only the accepted planning and engineering models presented in Section 9 will be used for this study. Based on the traditional nature of this study, conclusions presented in the decision document are unlikely to change prevailing practices.

At this early stage, it is unknown to what degree the project design will require redundancy, resiliency, and/or robustness. However, these qualities will be built into the range of flood risk management alternatives considered as part of the study.

The factors affecting the scope and level of review will be reassessed and the review plan will be updated at least three times; when the without-project conditions are identified; when the array of alternatives to be considered are identified; and when the preferred alternative is identified. These updates are especially important to validate the initial assessment that the project will not pose a significant threat to human life.

- d. **In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. Per the Feasibility Cost Sharing Agreement, the Rhode Island Department of Administration will provide \$15,000 of work in-kind to support project management, planning and public coordination activities. There will be no products or analyses provided by the non-Federal sponsor which will be subjected to review.

4. DISTRICT QUALITY CONTROL (DQC)

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan

(PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC.

- a. **Documentation of DQC.** Documentation of the technical and policy review of a specific product will be sufficient to allow both planning management and QC reviewers to feel confident that a comprehensive review was conducted in accordance with principles and guidelines established. It is expected that all in-progress review actions, review team meetings, and other significant technical review related actions will be documented in the form of a written memorandum prepared by the review leader. This memorandum will be provided to the ATR team to inform them that the internal DQC review has been completed by the New England District.

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the designated RMO and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead will be from outside the home MSC. Given the scope and nature of this single purpose flood risk management study, review team members with expertise across more than one discipline will be engaged where appropriate to limit the size and cost of the ATR effort.

- a. **Products to Undergo ATR.** Specific Products to undergo ATR include: Feasibility Scoping Meeting (FSM) documentation, Alternative Formulation Briefing (AFB) documentation, Draft Report (including NEPA and supporting documentation), and Final Report (including NEPA and supporting documentation.)
- b. **Required ATR Team Expertise.**

ATR Team Members/Disciplines	Expertise Required
ATR/ Planning Lead	The ATR lead should be a senior water resources planner with extensive experience in preparing FRM Civil Works decision documents and conducting ATRs. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead will serve as a reviewer for the plan formulation component of the study.
Economics	The team member for the economics portion of the ATR review will have knowledge of damage evaluation for flood reduction studies, stage damage curve assessments, structure evaluation, stage damage curve assessments HEC’s Expected Annual Flood Damage methodology
Environmental Resources	The team member for the environmental section should be an expert in the NEPA process, reviewing EAs, Fish & Wildlife Impacts, Coastal Zone Management and the Section 7 of Endangered Species Act, Sections 401 and 404 of the Clean Water

	Act, the Clean Air Act, the U.S. Fish and Wildlife Coordination Act, and Section 106 of the National Historic Preservation Act. The reviewer should also be familiar with cultural resources.
Hydraulic Engineering	The hydraulic engineering reviewer will be an expert in the field of hydraulics and have a thorough understanding of open channel dynamics, application of levees and flood walls, non-structural solutions involving flood warning systems and flood proofing, etc and the HEC-RAS v 4.0.1 computer model,
Civil/Gen Engineering	The person performing the review for the civil engineering portions of this study should have a good understanding of typical USACE FRM structural project designs such as levees, floodwalls and integrated pump systems. The reviewer should also be familiar with mechanical and electrical pump feasibility-level design fundamentals.
Geotechnical Engineer	The Geotechnical reviewer should be a senior geotechnical engineer familiar with geologic principles, static and dynamic slope stability evaluation, evaluation of the seepage through earthen embankments and under seepage through the foundation of the flood risk management structures, floodwalls, closure structures and other pertinent features, and in settlement evaluation of the structure. The reviewer should also have knowledge of boring logs, soil sampling techniques and testing methods for both geotechnical and environmental testing.
Risk Analysis	The risk analysis reviewer will be experienced with performing and presenting risk analyses in accordance with ER 1105-2-101 and other related guidance, including familiarity with how information from the various disciplines involved in the analysis interact and affect the results.
HTRW (Tentative)	This team member will be familiar with HTRW Site Inspection Reports, hazards mapping, soil sampling and environmental testing, groundwater monitoring, and groundwater testing.
Cost Engineering	The team member reviewing the cost engineering section of the report should have familiarity with cost estimates that have been developed in accordance with the guidance contained in ER 1110-2-1302, Civil Works Cost Engineering using the MII (MCACES Second Generation) cost estimating system. Cost estimates will be prepared for all items that are required for project construction for both Federal and non-Federal costs, including mitigation, operation and maintenance. The Cost Engineering review will be coordinated with the Cost Engineering Center of expertise at the Walla Walla District.
Real Estate	The real estate reviewer should be an expert in real estate acquisition, appraisals, temporary work area easements and real estate mapping.

c. **Documentation of ATR.** DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

- (1) The review concern – identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;
- (2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not been properly followed;
- (3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and
- (4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team will prepare a Review Report summarizing the review. Review Reports will be considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- Include a verbatim copy of each reviewer’s comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

ATR may be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team). A Statement of Technical Review should be completed, based on work reviewed to date, for the AFB, draft report, and final report. A sample Statement of Technical Review is included in Attachment 2.

Risk Informed Decision Process. All decision and implementation documents are required to undergo ATR, regardless of the originating organization (Planning, Engineering, Construction, or Operations). In deciding whether to undertake ATR for other work products, answering a series of questions will aid the PDT to help identify work products as decision or implementation documents, even if they are not identified as such. Also, this process provides a basis for making a recommendation whether undertaking ATR is appropriate for products that are not either a decision or implementation document. A “yes” answer does not necessarily indicate ATR is required, rather it indicates an area where reasoned thought and judgment should be applied and documented in the recommendation.

Does it include any design (structural, mechanical, hydraulic, etc)?

Yes.

Does it evaluate alternatives?

Yes.

Does it include a recommendation?

Yes.

Does it have a formal cost estimate?

Yes.

Does it have or will it require a NEPA document?

The Report will contain an EA/FONSI.

Does it impact a structure or feature of a structure whose performance involves potential life safety risks?

No, the project area is industrial/commercial area. No residential housing is located within the immediate study area. During an extreme flood event it is anticipated that employees at the three businesses located within the industrial park could be evacuated quickly and safely to higher ground immediately adjacent to the study area. Evacuations of industrial properties are typically conducted rapidly and without the delays and challenges faced in residential areas.

What are the consequences of non-performance?

Potential impacts to three industrial facilities and potential impacts to the Peterson Puritan Superfund site. The consequences of project non-performance will be analyzed further in the feasibility study.

Does it support a significant investment of public monies?

The initial cost estimate ranges from \$2.9 to \$15 million, below the threshold for IEPR.

Does it support a budget request?

Yes.

Does it change the operation of the project?

NA

Does it involve ground disturbances?

Construction of the recommended plan will likely require disturbing ground

Does it affect any special features, such as cultural resources, historic properties, survey markers, etc, that should be protected or avoided?

The project lies within the Blackstone River Valley National Heritage Corridor and the historic Blackstone Canal lies across the river from the study area. All attempts will be made to avoid any adverse impacts to this culturally significant resource.

Does it involve activities that trigger regulatory permitting such as Section 404 or storm water/NPDES related actions?

Construction of the recommended plan will likely require a Water Quality Certification under Section 401 and other state and local regulatory permitting.

Does it involve activities that could potentially generate hazardous wastes and/or disposal of materials such as lead based paints or asbestos?

Soil testing will be conducted within the study area to confirm that the material is not hazardous.

Does it reference use of or reliance on manufacturers' engineers and specifications for items such as prefabricated buildings, playground equipment, etc?

No.

Does it reference reliance on local authorities for inspection/certification of utility systems like wastewater, storm water, electrical, etc?

No.

Is there or is there expected to be any controversy surrounding the Federal action associated with the work product?

Controversy is not expected at this stage of the study but cannot be guaranteed until a recommended plan is selected and reviewed by the project stakeholders.

Based on the guidance and discussion with the PDT it was decided that an Agency Technical Review is necessary for the Blackstone FRM Feasibility Study.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR may be required for decision documents under certain circumstances. IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision, as described in EC 1165-2-209, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire

decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-209.

- Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.
- a. **Decision on IEPR.** Based on the guidance published in EC 1165-2-209, the Blackstone FRM study does not meet the requirements which trigger a Type I IEPR of the decision document. The study is so limited in scope, size (80-acres) and impact that the typical ATR review process is anticipated to be adequate and the project would not significantly benefit from a Type I IEPR. Additionally, the cost of an IEPR (\$150,000 - \$300,000 not including District costs) and time required (additional 2.5 months) are not justifiable given the scope and impact of this study. Table 1 and Table 2 illustrate whether this project triggers any of the mandatory or additional requirements from EC 1165-2-209 that warrant an IEPR. This project does not trigger any of the requirements contained in Table 1 or 2. An IEPR exclusion request was submitted to HQUSACE and approved in 2012. See section 3c above for additional information on the level of review required for this Feasibility Study.

Table 1. Mandatory Triggers	Yes	No
Significant threat to human life		X
Exceeds 45 million (1)		X
Governors Request		X
Controversial by DCW		X

1. Current project cost estimate ranges from \$2.9 to \$15 million.

Table2. Additional Triggers	Yes	No
EIS (1)		X
Impacts tribal/cultural/historic (2)		X
Impacts on F&W		X
ESA impacts		X

1. Feasibility Report expected to contain an EA/FONSI.

2. Based on the information provided above, and previous FRM studies of the Berkeley Industrial Park, it is the PDT's opinion that the project will have no adverse effects on the Blackstone River Valley National Heritage Corridor.

Additionally, the recommended plan for the Blackstone FRM Feasibility Study may be implementable under the USACE Section 205 CAP authority. Based on this scenario, guidance contained in EC 1165-2-209, page 11, section 3 states:

“A project study may be excluded from IEPR in cases where none of the mandatory triggers are met and:...
(c) if the project does not include an EIS and is a project study pursued under the CAP program.”

Given the scope and impact of this study, a Type II IEPR is not anticipated to be necessary at this time. Major alternatives being considered include typical USACE Structural and Non-Structural Flood Risk Management design alternatives. Given the nature of the previously described study area conditions, none of the alternatives being considered at this time for the study would be expected to pose any significant risk to human life and safety nor will the project be justified by life safety. However, once an actual recommended plan is chosen (after the AFB), the necessity for a Type II IEPR will be revisited, and a risk-informed decision analysis will be made to determine whether one will be conducted. If it is determined a Type II IEPR is needed at that time, this Review Plan will be revised to reflect that.

- b. Products to Undergo Type I IEPR. Not-Applicable. This study was excluded from Type I IEPR by HQ, US Army Corps of Engineers in 2012.**
- c. Required Type I IEPR Panel Expertise. Not-Applicable.**
- d. Documentation of Type I IEPR. Not-Applicable.**

7. POLICY AND LEGAL COMPLIANCE REVIEW

All decision documents will be reviewed throughout the study process for their compliance with law and policy. Guidance for policy and legal compliance reviews is addressed in Appendix H, ER 1105-2-100. These reviews culminate in determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods and the presentation of findings in decision documents.

8. COST ENGINEERING DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION

All decision documents shall be coordinated with the Cost Engineering DX, located in the Walla Walla District. The DX will assist in determining the expertise needed on the ATR team and Type I IEPR team (if required) and in the development of the review charge(s). The DX will also provide the Cost Engineering DX certification. The RMO is responsible for coordination with the Cost Engineering DX.

9. MODEL CERTIFICATION AND APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate,

and based on reasonable assumptions. Planning models, for the purposes of the EC, are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

- a. **Planning Models.** HEC-FDA is the only planning model to be used on this study in order to perform an integrated hydrologic engineering and economic analysis during the formulation and evaluation of flood risk management plans. HEC-FDA is a USACE-approved planning model.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
HEC-FDA 1.2.5 (Flood Damage Analysis)	The Hydrologic Engineering Center’s Flood Damage Reduction Analysis (HEC-FDA) program provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating flood risk management plans using risk-based analysis methods. The program will be used to evaluate and compare the future without- and with-project plans along the Blackstone River in Cumberland, Rhode Island to aid in the selection of a recommended plan to manage flood risk.	Certified

- b. **Engineering Models.** The following engineering models are anticipated to be used in the development of the decision document:

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
HEC-RAS 4.0.1 (River Analysis System)	The Hydrologic Engineering Center’s River Analysis System (HEC-RAS) program provides the capability to perform one-dimensional steady and unsteady flow river hydraulics calculations. The program will be used for steady flow analysis to evaluate the future without- and with-project conditions along the Blackstone River near Cumberland, Rhode Island. The HEC-RAS model for this study will be used for steady flow analysis. The review plan should indicate how the model will be used for a particular study.]	HH&C CoP Preferred Model

MII (Second Generation MCACES software)	The MII cost engineering program will be utilized to develop construction costs of study alternatives. MII provides an integrated cost estimating system (software and databases) that meets the U.S. Army Corps of Engineers (USACE) requirements for preparing cost estimates.	Approved
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10. REVIEW SCHEDULES AND COSTS

a. ATR Schedule and Cost.

FSM Documentation ATR Schedule (budget \$15k):

1- FSM Documentation submitted to ATR team	05/01/12
2- Deadline for comments from ATR team into Dr. Checks	05/15/12
3- Deadline for comments to be evaluated by PDT members	05/30/12
4- Deadline for ATR back-checking	06/15/12

AFB Documentation ATR Schedule (budget \$20k):

1- AFB Documentation submitted to ATR team	09/01/12
2- Deadline for comments from ATR team into Dr. Checks	09/15/12
3- Deadline for comments to be evaluated by PDT members	09/30/12
4- Deadline for ATR back-checking	10/15/12

Draft Report ATR Schedule (budget \$10k):

1- Draft Report submitted to ATR team	1/15/13
2- Deadline for comments from ATR team into Dr. Checks	1/30/13
3- Deadline for comments to be evaluated by PDT members	2/15/13
4- Deadline for ATR back-checking	2/30/13

Final Report ATR Schedule (budget \$10k):

1- Draft Report submitted to ATR team	4/01/13
2- Deadline for comments from ATR team into Dr. Checks	4/15/13
3- Deadline for comments to be evaluated by PDT members	4/30/13
4- Deadline for ATR back-checking	5/15/13

b. Type I IEPR Schedule and Cost. Not-Applicable.

- c. **Model Certification/Approval Schedule and Cost.** All of the models anticipated to be used for this feasibility study are already certified or approved for use.

11. PUBLIC PARTICIPATION

Public participation and comment will be received concurrently with the State and Agency review upon the issuance of the Public Notice signifying the release of the Draft Feasibility Report and Integrated Environmental Assessment (EA). Significant and relevant public comments will be provided to reviewers prior to the initiation of the review period. The final decision document and associated review reports will be made available to the public via the project's web page.

12. REVIEW PLAN APPROVAL AND UPDATES

The North Atlantic Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval are documented in Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the RMO and home MSC.

13. REVIEW PLAN POINTS OF CONTACT

Public questions and/or comments on this review plan can be directed to the following points of contact:

- Home District; Project Manager, (978) 318-8172
- Major Subordinate Command; NAD Planning poc for NAE, (978) 318-8643
- Planning Center of Expertise; FRM-PCX Program Manager (415) 503-6852

ATTACHMENT 1: TEAM ROSTERS

Vertical Team POCs

Title	Name	Phone
District Support Team (DST)	Paul Sabalis	347-370-4589
North Atlantic Division MSC POC	Richard Ring	978-318-8643
North Atlantic Division FRM-PCX POC	Jodi McDonald	917-790-8720
Regional Integration Team POC	Catherine Shuman	202-761-1379
FRM Planning Center of Expertise POC	Eric Thaut	415-503-6852

Home District Project Development Team Roster

Title	Name	Org	Phone
Planning – PM	Byron Rupp	E6L0620	978-318-8172
Environmental Resources	Catherine Rogers	E6L0710	978-318-8029
Economics	Karen Umbrell	E6L0720	978-318-8140
Cultural Resources	Marcos Paiva	E6L0720	978-318-8796
Hydrology/Hydraulics	Patrick Blumeris	E6L0510	978-318-8094
Civil Design	Mark DeSouza	E6L0310	978-318-8784
Geotechnical	Jonathan Kullberg	E6L0540	978-318-8178
Geology/Chemistry	Mark Koenig	E6L0430	978-318-8650
Cost Engineering	William Mcintyre	E6L0301	978-318-8120
Structural Engineering	Maruti Wagle	E6L0350	978-318-8044
Mechanical Engineering	Deborah Gabrielson	E6L0350	978-318-8466
Electrical Engineering	Jeanine Cline	E6L0350	978-318-8143
Real Estate	Jeffrey Teller	E6N0100	978-318-8030

ATR Project Development Team Roster

Title	Name	Phone
ATR Lead/Planning	Michelle Kniep	314-331-8404
Economics		
H&H		
Environmental Resources		
Geotech		

Civil Engineering		
Structural Engineering		
Cost Estimates		
Real Estate		

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the *<type of product>* for *<project name and location>*. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrCheckssm.

SIGNATURE

Name
ATR Team Leader
Office Symbol/Company

Date

SIGNATURE

Byron Rupp
Project Manager
Office Symbol

Date

SIGNATURE

Name
Architect Engineer Project Manager¹
Company, location

Date

SIGNATURE

Name
Review Management Office Representative
Office Symbol

Date

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows: Describe the major technical concerns and their resolution.

As noted above, all concerns resulting from the ATR of the project have been fully resolved.

SIGNATURE

Name
Chief, Engineering Division
Office Symbol

Date

SIGNATURE

Name
Chief, Planning Division
Office Symbol

Date

¹ Only needed if some portion of the ATR was contracted

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number