



DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
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WASHINGTON, DC 20310-2600

DAEN

17 June 2024

SUBJECT: Metropolitan Washington, District of Columbia, Coastal Storm Risk Management

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on coastal storm risk management recommendations for the Metropolitan Washington, District of Columbia, Coastal Storm Risk Management. It is accompanied by the report of the Baltimore District engineer. This study is an interim response to the authorization in the Middle Potomac Watershed authority, adopted by a resolution of the U.S. Senate Committee on Environment and Public Works, dated 23 May 2001. The authorization provided that the Secretary of the Army review the report of the Chief of Engineers on the Potomac River and Tributaries in Maryland, Virginia, and Pennsylvania published in House Document 343, ninety-first Congress, second session, and other pertinent reports, with a view to conducting a study, in cooperation with the States of Maryland and West Virginia, the Commonwealths of Pennsylvania and Virginia, and the District of Columbia, their political subdivisions and agencies and instrumentalities thereof, other Federal agencies and entities, for improvements in the interest of the ecosystem restoration and protection, floodplain management, and other allied purposes for the middle Potomac River watershed. There is an existing federal project adjacent to the Recommended Plan feature – the Four Mile Run local flood protection project authorized in 1974 (Public Law 93-251, Section 84) and constructed in 1980 as a flood risk management project. Preconstruction engineering and design activities will continue under the study authority cited above.

2. The reporting officers recommend authorizing a risk management system of features that will reduce the risk of damages from coastal storms to a critical facility. The Recommended Plan is not the National Economic Development (NED) Plan. An NED Policy Exception was approved by the Assistant Secretary of the Army for Civil Works on March 18th, 2024, based on Other Social Effects (OSE) and Environmental Quality (EQ) considerations. The Recommended Plan includes the following system of structural features at the Arlington Water Pollution Control Plant (WPCP) in Arlington County, VA:

- a. Floodwall with an elevation of +14.3 ft NAVD88 and a length of 1,180 linear feet to be constructed along the north bank of Four Mile Run stream between the stream and the critical infrastructure facility.

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- b. 70ft long aluminum stop log closure structure at the east end of the floodwall along South Eads Street. The west end of the floodwall will tie into high ground.
- c. 1,280 linear feet of +1 ft concrete elevated curb.
- d. Sluice and flap gates.

3. Metropolitan Washington Council of Governments was the non-federal sponsor for the study, and Arlington County, VA will be the non-federal sponsor responsible for continuing the project through the design and construction phases. In addition to the Recommended Plan this study acknowledges and relies upon the non-federal sponsor's additional floodplain management responsibilities and emergency response actions in conjunction with state and Federal Emergency Management Agency (FEMA) related programs to mitigate the plan's residual risk including potential life loss and damages to critical infrastructure. Based on October 2023 price levels, the estimated total project first cost is \$15,230,000. The total project first cost includes the value of lands, easements, rights-of-way, relocations, and disposals (LERRD) estimated to be \$1,052,000. The LERR includes a perpetual flood protection easement for the floodwall, temporary work area easements, and relocations necessary for construction. Cost sharing is applied in accordance with the provisions of Section 103 of the Water Resources Development Act (WRDA) of 1986 (33 U.S.C. § 2213), as follows:

a. The federal share of the project first cost for initial construction is estimated at \$9,899,500 and the non-federal share, which includes the cost of LERRD, is estimated at \$5,330,500 (\$4,278,500 after the LERRD credit), which equates to 65 percent federal and 35 percent non-federal.

b. The additional annual cost of operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) for the Recommended Plan is estimated to be \$153,000. OMRR&R activities include deploying the closure structure at a minimum of once annually and providing general maintenance on the closure gate. The non-federal sponsor will be responsible for 100 percent of the cost of project OMRR&R.

4. Based on a 2.75% discount rate and a 50-year economic period of analysis, the equivalent average annual benefits are estimated at \$516,000 and equivalent average annual costs are estimated at \$728,000, with equivalent average annual net benefits of -\$212,000 and a benefit-to-cost ratio (BCR) of 0.7. All project costs are allocated to the authorized purpose of coastal storm risk management.

5. The recommended plan for this critical infrastructure contributes to NED, regional economic development, EQ and OSE. The facility receives and treats wastewater from much of Arlington County, portions of Fairfax County, Falls Church and Alexandria; serving a population of more than 220,000 people. The facility's mission is to safely and economically process wastewater and hazardous waste materials to protect the

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environment: especially Four Mile Run, the Potomac River, and the Chesapeake Bay. The facility must remain operational during a storm event to minimize negative health, safety, and environmental impacts from release of effluent into adjacent water bodies as well as minimize the risk of wastewater backing up into occupied spaces.

6. The Recommended Plan meets the requirements of Executive Orders 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), 13990 (Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis), 14091 (Further Advancing Racial Equity and Support for Underserved Communities Through the Federal Government), and 14096 (Revitalizing Our Nation's Commitment to Environmental Justice for All), and complies with the Justice40 Initiative. Of the population and area served by the facility, more than 27,500 people (approximately 13 percent of the population) reside in six economically disadvantaged communities, including Glencarlyn, Barcroft, Arlington Mill, Buckingham, Lee Boulevard Heights, and Arlington Forest.

7. The study report describes coastal storm risk to structures and life safety associated with coastal storms. The Recommended Plan would reduce, but not eliminate future damages and residual risk would remain. The Recommended Plan reduces expected annual damages by approximately 90 percent relative to the without project conditions at the Arlington WPCP facility. The residual risk, along with the potential consequences, has been communicated to the non-federal sponsor and will become a requirement of any communication and evacuation plan. The study identified other areas and critical infrastructure vulnerable to coastal storm risks including, but not limited to, the communities of Belle Haven, Lynhaven and Arlandria (at Four Mile Run), the City of Alexandria, other coastal floodplain areas adjacent to the Potomac River, and the Ronald Reagan National Airport. The study identified potential structural and nonstructural coastal storm risk management concepts for those areas. These areas could be studied further by USACE or other federal or non-federal parties. The draft report originally recommended a levee and floodwall structural coastal storm risk management plan for Belle Haven; however, a non-federal sponsor for design and construction implementation has not been identified to date. While other planning areas studied are subject to coastal storm risks, those areas were not economically justified for inclusion in the recommended plan and did not offer OSE or EQ benefits sufficient to justify their inclusion.

8. The study evaluated potential impacts of sea level change in formulating and engineering the recommended plan. To address this uncertainty, project performance was assessed at the intermediate sea level change scenario as it offered the best balance between equally likely scenarios (i.e., the historic rate of sea level rise continuing indefinitely and the high rate including accelerated rates of change caused by warming temperatures and accelerated ice melt). USACE will continue to monitor local conditions and determine if the intermediate scenario of sea level change is reasonably representative of observed conditions. If observed conditions significantly

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exceeding the intermediate projection are identified during design or construction, reevaluation of the Recommended Plan will be required.

9. All compliance with required applicable environmental laws and regulations has been completed.

10. In accordance with USACE policy on the review of decision documents, all technical, engineering, and scientific work underwent an open, dynamic, and rigorous review process. The comprehensive review process included District Quality Control Review, Agency Technical Review, Type I Independent External Peer Review (IEPR), and Headquarters Policy and Legal Compliance review to confirm the planning analyses, alternative design and safety, and the quality of decisions. Washington-level review indicates that the plan recommended by the reporting officers complies with all essential elements of the U.S. Water Resources Council's Economic and Environmental Principles, Requirements, and Guidelines for Water and Land Related Resources Implementation Studies, as well as other administrative and legislative policies and guidelines. The views of interested parties, including federal, state, and local agencies, were considered and all comments from public reviews have been addressed and incorporated into the final report documents where appropriate.

11. USACE decision documents recognize cost risk and uncertainty surrounding implementation. All cost estimates will carry a degree of uncertainty. The estimated total project first cost for the Recommended Plan at the 80% confidence interval is estimated at \$15,230,000. This project carries a degree of uncertainty such that if the main drivers described below are realized, the first cost for the Recommended Plan could increase to approximately \$18,671,000. The recommended plan has various construction and non-construction components. These components range from 10 to 60 percent in project definition. The overall recommended plan is at 15 percent design. Based on the recommended project design of the construction components and scope definition of the non-construction components, the total project cost is designated as a Class 3 estimate. The total project first cost includes a contingency value of \$3,842,000, which is approximately 34 percent of the estimated base project cost of \$11,388,000. The cost contingencies are intended to cover cost and schedule increases due to the identified project risks and their probability of occurrence. Changes to assumptions or the basis of design can result in additional risks not currently identified. For the Recommended Plan project first costs, the currently known major uncertainty drivers are the following: 1) limited groundwater sampling data may result in construction methods and construction delivery schedule impacts, as there may be contaminated groundwater at the site based on an initial assessment; 2) limited geotechnical analysis available may result in further refinements to the foundation of the floodwall; 3) variation in major material costs and bid assumptions, 4) ability of the non-federal sponsor to provide their share of funds and obtain all required real estate interests in a timely fashion as reflected in the project schedule, and 5) any changes to assumptions on productivity, construction sequencing due to funding allocations and future market conditions can affect overall project cost. As the project moves into the next phases, USACE will focus risk management and

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mitigation on the primary cost and other significant risk drivers to the extent within USACE control. However, there still exists the potential for other unanticipated and uncontrollable changes in environmental or economic conditions that could further increase the total project first cost beyond the current estimate and/or necessitate changes in the project's design.

12. In full consideration of the risks as documented in the preceding paragraphs in this report, I concur in the findings, conclusions, and recommendation of the reporting officers. Accordingly, I recommend that coastal storm risk management improvements for Arlington County, Virginia, be authorized in accordance with the reporting officers' Recommended Plan at an estimated cost of \$15,230,000 for initial construction, with such modifications as in the discretion of the Chief of Engineers may be advisable. Federal implementation of the project for coastal storm risk management includes, but is not limited to, the following items of local cooperation to be undertaken by the non-federal sponsor in accordance with applicable federal laws, regulations, and policies:

- a. Provide 35 percent of construction costs, as further specified below:
 1. Provide, during design, 35 percent of design costs in accordance with the terms of a design agreement entered into prior to commencement of design work for the project;
 2. Provide all lands, easements, rights-of-way, and placement areas and perform all relocations determined by the Federal government to be required for the project;
 3. Provide, during construction, any additional contribution necessary to make its total contribution equal to at least 35 percent of construction costs;
- b. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the level of coastal storm risk reduction the project affords, hinder operation and maintenance of the project, or interfere with the project's proper function;
- c. Inform affected interests, at least yearly, of the extent of risk reduction afforded by the project; participate in and comply with applicable Federal floodplain management and flood insurance programs; prepare a floodplain management plan for the project to be implemented not later than one year after completion of construction of the project; and publicize floodplain information in the area concerned and provide this information to zoning and other regulatory agencies for their use in adopting regulations, or taking other actions, to prevent unwise future development and to ensure compatibility with the project;
- d. Operate, maintain, repair, rehabilitate, and replace the project or functional portion thereof at no cost to the Federal government, in a manner compatible with the

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project's authorized purposes and in accordance with applicable Federal laws and regulations and any specific directions prescribed by the Federal government;

e. Give the Federal government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the project to inspect the project, and, if necessary, to undertake work necessary to the proper functioning of the project for its authorized purpose;

f. Hold and save the Federal government free from all damages arising from design, construction, operation, maintenance, repair, rehabilitation, and replacement of the project, except for damages due to the fault or negligence of the Federal government or its contractors;

g. Perform, or ensure performance of, any investigations for hazardous, toxic, and radioactive wastes (HTRW) that are determined necessary to identify the existence and extent of any HTRW regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601-9675, and any other applicable law, that may exist in, on, or under real property interests that the Federal government determines to be necessary for construction, operation and maintenance of the project;

h. Agree, as between the Federal government and the non-Federal sponsor, to be solely responsible for the performance and costs of cleanup and response of any HTRW regulated under applicable law that are located in, on, or under real property interests required for construction, operation, and maintenance of the project, including the costs of any studies and investigations necessary to determine an appropriate response to the contamination, without reimbursement or credit by the Federal government;

i. Agree, as between the Federal government and the non-Federal sponsor, that the non-Federal sponsor shall be considered the owner and operator of the project for the purpose of CERCLA liability or other applicable law, and to the maximum extent practicable shall carry out its responsibilities in a manner that will not cause HTRW liability to arise under applicable law; and


j. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended, (42 U.S.C. 4630 and 4655) and the Uniform Regulations contained in 49 C.F.R Part 24, in acquiring real property interests necessary for construction, operation, and maintenance of the project including those necessary for relocations, and placement area improvements; and inform all affected persons of applicable benefits, policies, and procedures in connection with said act.

13. The recommendation contained herein reflects the information available at this time and current departmental policies governing formulation of individual projects. It does

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not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program or the perspective of higher review levels within the Executive Branch. Consequently, the recommendation may be modified before it is transmitted to the Congress as a proposal for authorization and implementation funding. However, prior to transmittal to Congress, the non-federal sponsor, interested federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.

A handwritten signature in black ink, appearing to read "S.A. Spellmon". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

SCOTT A. SPELLMON
Lieutenant General, USA
Chief of Engineers