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

DAEN

11 September 2024

SUBJECT: Tar Pamlico River Basin, North Carolina, Flood Risk Management

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on flood risk management recommendations for the Tar Pamlico River Basin, North Carolina. It is accompanied by the report of the Pittsburgh District engineer. This study is an interim response to the authorization by the House Committee on Transportation and Infrastructure Resolution adopted April 11, 2000, which provided that the Secretary of the Army review a prior report of the Chief of Engineers on the Tar River, North Carolina, with a view towards determining the feasibility of flood damage reduction. The study is also authorized by a resolution adopted by the House Committee on Transportation and Infrastructure Resolution adopted May 21, 2003, which provided that the Secretary of the Army should review a prior report of the Division Engineer, and the Chief of Engineers, with a view towards flood damage reduction, environmental restoration and protection, and related purposes for the Tar Basin and its estuarine areas including Pamlico Sound. Preconstruction engineering and design (PED) activities will continue under the study authority.

2. The reporting officers recommend authorizing a flood risk management system of features that will reduce the risk of damages from inland flooding to residential and commercial structures. The Recommended Plan is the Comprehensive Benefits Plan. A National Economic Development (NED) Policy Exception was approved by the Assistant Secretary of the Army for Civil Works on 2 February 2024 based on other social effects (OSE) and environmental justice (EJ). The Recommended Plan includes the following system of nonstructural features which are intended to provide flood risk reduction up to the 1 percent annual exceedance probability event:

a. Dry Floodproofing of 94 commercial structures;

b. Elevation of 35 residential structures;

c. Elevation and flood venting of 18 structures;

d. Flood venting of 8 structures.

The Recommended Plan includes nonstructural measures being implemented at 155 structures. Due to the nature of this recommendation, each structure could be implemented as a separable feature, or they could be done in various combinations. Of

that total, 37 structures were in river reaches that were economically justified by NED benefits. The NED policy exception approved adding 118 structures located within the river reaches not having positive NED benefits based on OSE and EJ benefits. It is expected that the nonstructural plan will be completed in 12 years which includes one year of outreach and application period, two years of PED, and 8 years of construction.

3. The North Carolina Department of Environmental Quality (NCDEQ) is the non-federal cost sharing sponsor for all features of the project. 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 2024 price levels, the estimated total project first cost is $98,700,000. The total project first cost includes the value of lands, easements, rights-of-way, and relocations (LERR) associated with the Recommended Plan. There is no land acquisition required for disposal for the Recommended Plan and therefore no disposal area improvement requirements. LERR costs are estimated to be $5,500,000. Depending on the specifics of the individual structure, and current nonstructural guidance, the Recommended Plan may require the non-federal cost sharing sponsor to acquire a perpetual restrictive easement after the property owner and sponsor enter into a participation agreement. As part of these participation agreements, relocation assistance may be offered as part of each action. The project first cost for LERR recommends and includes approximately $3.1M of temporary relocation assistance benefits for all of the 155 structures as a matter of policy. Final relocation assistance costs and eligibility will be determined during the design phase. 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 $64,200,000 and the non-federal share, which includes the cost of LERR, is estimated at $ 34,500,000. This equates to 65 percent federal and 35 percent non-federal.

b. The annual cost of operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) for the Recommended Plan is expected to be de minimus, with the non-federal sponsor responsible for 100 percent of the cost of project OMRR&R. OMRR&R activities include periodic inspections and monitoring to ensure that properties elevated or floodproofed are in compliance with the applicable real estate restrictions, e.g., keeping the flood vents free of obstructions and ensuring that floodproofing features remain functional.

4. Based on a 2.75 percent discount rate and a 50-year period of analysis, the equivalent average annual benefits are estimated at $2,940,000 and equivalent average annual costs are estimated at $3,670,000, with equivalent average annual net benefits of (-$723,000) and a benefit-to-cost ratio (BCR) of 0.8 to 1. All project costs are allocated to the authorized purpose of flood risk management.

5. The Recommended Plan will provide NED, OSE, and EJ benefits, which provides greater overall public benefits than the NED plan. The Recommended Plan uses comprehensive benefits to extend the application of nonstructural measures to an additional 118 structures beyond the NED plan. The incremental cost difference between the NED plan and approximately three-fold increase for the Recommended Plan provides benefit to nearly four times as many structures—structures located within disadvantaged and socially vulnerable communities. The underserved and disadvantaged communities have historically experienced the greatest impacts from flooding and have increased vulnerabilities in the face of climate change. These conditions emphasize the burden that flood risk places on socially vulnerable communities within the study area.

6. The Recommended Plan aligns with the current Administration's prioritization of environmental justice as set out by Executive Order (EO) 13390, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis (2021) and the existing EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1994). The Recommended Plan promotes increased resilience and community cohesion within the most socially vulnerable and disadvantaged communities across the study area. Socially vulnerable communities typically have less resources to prepare for or recover from crises and natural disasters, making them less resilient to the effects of severe weather events. Community cohesion is ensured by keeping communities intact by providing equal assistance to all individuals affected by the calculated flood risk, including those individuals that represent socially vulnerable and historically underserved populations, preserving diversity and equal opportunity within affected communities.

7. The study report fully describes flood risk to structures associated with riverine flooding. The Recommended Plan was formulated to reduce the risk of flood damages to residential and commercial structures resulting from a flood event with an annual exceedance probability of 1 percent. The Recommended Plan would greatly reduce, but not eliminate future damages and residual risk would remain. The Recommended Plan reduces expected annual damages by approximately 52 percent relative to the without project conditions. 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.

8. Implementation strategies for the risk management system would be a shared responsibility conducted in coordination with the non-federal sponsor. Various implementation strategies to identify risk reduction prioritization were considered for the Recommended Plan, including:

a. Clustering: Addressing groups of structures within a small geographic area is more cost effective, efficient, and allows for a more strategic methodology for implementing nonstructural measures. This approach would rank efficiency as the main factor in determining which eligible properties should be prioritized.

b. Risk Level: Structures within a geographic cluster will be evaluated and prioritized based on flood risk. This approach couples risk exposure and clustering to determine the prioritization of eligible structures.

9. All compliance with required applicable environmental laws and regulations has been completed. The Recommended Plan will not significantly impact the natural environment, including wetlands, aquatic habitat, riparian habitat, threatened and endangered species or critical habitat. A Section 106 Programmatic Agreement has been executed with the North Carolina State Historic Preservation Officer for this study.

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, 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 $98,700,000 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 $118,000,000. The Recommended Plan has various construction and non-construction components. These components range from 6 to 50 percent in project definition. The overall Recommended Plan is at 20 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 $29,100,000, which is approximately 43 percent of the estimated base project cost of $70,000,000. 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) changes in construction sequencing or phasing could impact the scheduled duration either making it shorter or longer; 2) potential for multiple contract modifications due to the number of structures and locations; 3) a shift to a funding constrained schedule could impact the overall duration and cost of the project; 4) variation in major material costs and bid assumptions,

including the assumption that there would be no issues finding qualified floodproofing contractors; 5) 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 6) 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 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 flood risk management improvements for the Tar Pamlico River Basin be authorized in accordance with the reporting officers' Recommended Plan at an estimated cost of $98,700,000 for initial construction, with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing and other applicable requirements of federal laws, regulations, and policies. Federal implementation of the project for nonstructural, natural, or nature-based flood risk management includes, but is not limited to, the following required 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 perform all relocations determined by the federal government to be required for the project; and, provide any required disposal area improvements;

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 flood 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 flood risk management features; 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 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 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 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.

SCOTT A. SPELLMON
Lieutenant General, USA
Chief of Engineers