



DEPARTMENT OF THE ARMY  
CHIEF OF ENGINEERS  
2600 ARMY PENTAGON  
WASHINGTON, D.C. 20310-2600

DEC 14 2017

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SUBJECT: Mamaroneck and Sheldrake River Basins

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on flood risk management for the Mamaroneck and Sheldrake River Basins, Village of Mamaroneck, New York. It is accompanied by the report of the New York District Engineer and the North Atlantic Division Engineer. The Mamaroneck and Sheldrake River Basins, Flood Risk Management project was authorized by Section 401(a) of the Water Resources Development Act (WRDA) of 1986. This report addresses the most critical and vulnerable portion of the authorized study area in the village of Mamaroneck, which was heavily impacted by an April 2007 nor'easter. The storm produced the flood of record for the village of Mamaroneck, equivalent to the one percent flood event. It caused over \$50,000,000 in damages and impacted over 50 percent of total structures within the study area. Floodwaters peaked on the Mamaroneck River in approximately four hours and in approximately six hours on the Sheldrake River during this flood event. As such, the evacuation time for approximately 19,000 residents of the study area was severely restricted which created a high risk to life safety. Over forty percent of residents require evacuation assistance prior to floodwaters peaking including a large population of children that attend a school located within the area of the most severe flooding. Two deaths have occurred as a result of flooding in the project area in the last 25 years, most recently in 2007.

2. The reporting officers recommend authorizing a plan to reduce flood risk by the construction of retaining walls and a diversion culvert, the deepening and widening of river channels, structure elevation, and the removal/replacement of 2 vehicular bridges that constrict flood flow. The recommended plan includes approximately 7,500 linear feet of channelization (trapezoidal earthen channels) and 8,660 feet of retaining walls for the Mamaroneck and Sheldrake Rivers. The removal of existing bridges and the deepening and/or widening of both rivers would increase the flood flow channel capacity and thereby reduce water surface elevations in the village of Mamaroneck during a flood. In addition, a diversion culvert, approximately 390 linear feet in length, would bypass flood water on the Mamaroneck River downstream of the confluence, thereby avoiding significant river constrictions. Nonstructural features would include the elevation of eight (8) residential structures in the Harbor Heights neighborhood and one (1) commercial structure on the Sheldrake River within the village of Mamaroneck.

3. The recommended plan is estimated to reduce equivalent annual damages (EAD) by approximately \$2,960,000 or 87% with a residual EAD of approximately \$450,000. Annual exceedance probabilities for the village of Mamaroneck would be reduced from approximately a

DAEN

SUBJECT: Mamaroneck and Sheldrake Rivers Basin, New York

20 percent flood event to, depending on location, a 2 percent to 0.5 percent flood event. The implementation of the recommended plan will not completely eliminate the potential for loss of life; however, it may reduce the risk of loss of life by decreasing the frequency of flooding from out-of-bank flood events.

4. The recommended plan would have unavoidable impacts to historic properties, vegetation, and some wildlife habitats. A Memorandum of Agreement to account for adverse effects to historic properties has been executed with the New York State Office of Parks, Recreation and Historic Preservation, which serves at the New York State Historic Preservation Office. The affected historic properties include the Works Progress Administration-constructed retaining walls and Ward Avenue Bridge, which will be removed and replaced as part of the project. Cultural mitigation of this adverse effect includes historic property documentation of the retaining walls and bridge. As part of this mitigation, the Village of Mamaroneck Historian and the Village of Mamaroneck Historical Society will be participating in this effort as consulting parties. No significant adverse impacts to vegetation and wildlife would be expected as a result of construction with the inclusion of the following: Stormwater Pollution Prevention Plan(s), seasonal windows for tree removal and river channel work, and best management practices such as planting native vegetation and trees.

5. The New York State Department of Environmental Conservation (NYSDEC) is the non-Federal cost-sharing sponsor for the authorized project. Based on an October 2016 price level, the estimated total first cost of the recommended plan is \$82,250,000. The Federal share of the estimated first cost of initial construction is currently estimated at \$53,500,000 with a non-Federal share of \$28,750,000. The non-Federal share includes the costs of lands, easements, rights-of-way, relocations, and disposal which are estimated at \$19,150,000. The NYSDEC would also be responsible for the operation, maintenance, repair, replacement and rehabilitation (OMRR&R) of the project after construction, a cost currently estimated at \$360,000 per year.

6. Based on a 2.875% discount rate for Fiscal Year 2017 and a 50-year period of analysis, the total average annual costs of the project are estimated to be \$3,650,000, including OMRR&R. The recommended plan has primary outputs based on flood risk management. The total average annual benefits are estimated to be \$3,820,000. The net average annual benefits are approximately \$170,000. The benefit-to-cost ratio (BCR) is 1.05 to 1.

7. The goals and objectives included in the Campaign Plan of the U.S. Army Corps of Engineers (USACE) have been fully integrated into the Mamaroneck and Sheldrake River Basins, Village of Mamaroneck, New York, Flood Risk Management study process. The recommended plan has been designed to avoid or minimize environmental impacts while maximizing future safety and economic benefits to the community. As flood waters can elevate up to a depth of 8 feet within 4 hours, as reported during the April 2007 flood event, evacuation, transportation and emergency services can be extremely limited if not impossible as seen by the two deaths that have already occurred in the village of Mamaroneck. Critical facilities such as schools, daycares, hospitals, emergency services and senior care centers are located within the 1% floodplain and are at the

DAEN

SUBJECT: Mamaroneck and Sheldrake Rivers Basin, New York

greatest risk for such a rapid evacuation. The risk to life safety is significant for this socially vulnerable population. The study team organized and participated in stakeholder meetings and public workshops throughout the process and worked with local groups to achieve a balance of project goals and public concerns through the modernization of the Civil Works planning program and processes. The study report fully describes flood risk associated with the village of Mamaroneck and risks that will not be reduced; these residual risks have been communicated to the state of New York, Westchester County, and the residents of the village of Mamaroneck.

8. In accordance with EC 1165-2-214, Civil Works Review, all technical, engineering and scientific work underwent an open, dynamic and vigorous review process to ensure technical quality. This included an Agency Technical Review (ATR), a Type I Independent External Peer Review (IEPR) and a Headquarters USACE policy and legal review. All concerns of the ATR have been addressed and incorporated in the final report. The ATR comments helped to more clearly communicate the information that was provided in the report. The IEPR was managed by Battelle Memorial Institute. All comments from the above referenced reviews have been addressed and incorporated into the final documents. Overall, the reviews resulted in improvements to the technical quality of the report. A safety assurance review, Type II IEPR, will be conducted during the design phase of the project.

9. Washington level review indicates that the project recommended by the reporting officers is technically sound, environmentally and socially acceptable, and economically justified. The plan complies with all essential elements of the 1983 U.S. Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Land Related Resources Implementation Studies and complies with other administrative and legislative policies and guidelines. Also the views of interested parties, including Federal, state and local agencies have been considered. During the State and Agency Review, a letter was received from the U.S. Department of the Interior on 23 May 2017 stating that they had no comments to submit.

10. I concur in the findings, conclusions, and recommendations of the reporting officers. Accordingly, I recommend that the plan to reduce flood damage in the Village of Mamaroneck, New York, be authorized in accordance with the reporting officers' recommended plan at an estimated cost of \$82,250,000 with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing, financing, and other applicable requirements of Federal laws and policies, including Section 103 of P.L. 99-662, WRDA 1986, as amended (33 U.S.C. 2213). These requirements include, but are not limited to, the following items of local cooperation from the non-Federal sponsor:

a. Provide a minimum of 35 percent, but not to exceed 50 percent, of total flood risk management costs as further specified below:

DAEN

SUBJECT: Mamaroneck and Sheldrake Rivers Basin, New York

(1) Pay, during construction, 5 percent of total flood risk management costs.

(2) Provide all lands, easements, and rights-of-way, including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material, and perform or ensure the performance of all relocations, as determined by the government to be required for the construction, operation, and maintenance of the project.

(3) During construction, pay any additional funds necessary to make its total contribution equal to at least 35 percent of total flood risk management costs.

b. Inform affected interests, at least yearly, of the extent of protection afforded by the flood risk management features; participate in and comply with applicable Federal floodplain management and flood insurance programs; comply with Section 402 of P.L. 99-662, the WRDA of 1986, as amended (33 U.S.C. 701b-12); 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 protection levels provided by the flood risk management features.

c. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) such as any new developments on project lands, easements, and rights-of-way or the addition of facilities which might reduce the level of protection the flood risk management features afford, hinder operation and maintenance of the project, or interfere with the project's proper function.

d. Keep the recreation features, and access roads, parking areas, and other associated public use facilities, open and available to all on equal terms.

e. Operate, maintain, repair, rehabilitate, and replace the project, at no cost to the Federal Government, in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and state laws and regulations and any specific directions prescribed by the Federal Government.

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

g. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), P.L. 96-510, as amended (42 U.S.C. 9601-9675), that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of the project.

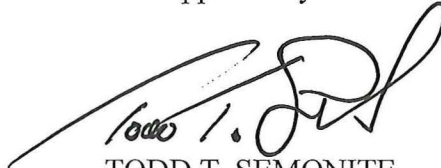
DAEN

SUBJECT: Mamaroneck and Sheldrake Rivers Basin, New York

h. Assume, as between the Federal Government and the non-Federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights-of-way required for construction, operation, and maintenance of the project.

i. Agree, as between the Federal Government and the non-Federal sponsor, that the non-Federal sponsor shall be considered the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, repair, rehabilitate, and replace the project in a manner that will not cause liability to arise under CERCLA.

11. 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 sponsor, the state, interested Federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.



TODD T. SEMONITE  
Lieutenant General, USA  
Chief of Engineers