SCOPING DOCUMENT

Rahway River Basin
Flood Risk Management Feasibility Study
Essex and Union Counties, NJ

June 2015

Prepared by:

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US ARMY CORPS
OF ENGINEERS
NEW YORK DISTRICT

NEW JERSEY
DEPARTMENT OF
ENVIRONMENTAL
PROTECTION

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LIST OF ACRONYMS

Acronym	Title
BCR	Benefit Cost Ratio
CERCLA	Comprehensive, Environmental Response, Compensation Liability Act
CERCLIS	Comprehensive Environmental Response, the Compensation and Liability Information System
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulation
Corps	United States Army Corps of Engineers
CWA	Clean Water Act
District	United States Army Corps of Engineers, New York District
EIS	Environmental Impact Statement
ETL	Engineering Technical Letter
GRR	General Reevaluation Report
HTRW	Hazardous, Toxic and Radioactive Waste
KCS	Known Contaminated Sites
LPP	Locally Preferred Plan
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NED	National Economic Development
NEPA	National Environmental Policy Act
NGO	Non-Government Organizations
N.J.A.C.	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NJHPO	New Jersey Historic Preservation Office
NPL	National Priority List
NWI	National Wetlands Inventory
P&G	Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies
RCRIS	Resource Conservation and Recovery Information System
TSP	Tentatively Selected Plan
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service

1.0 INTRODUCTION

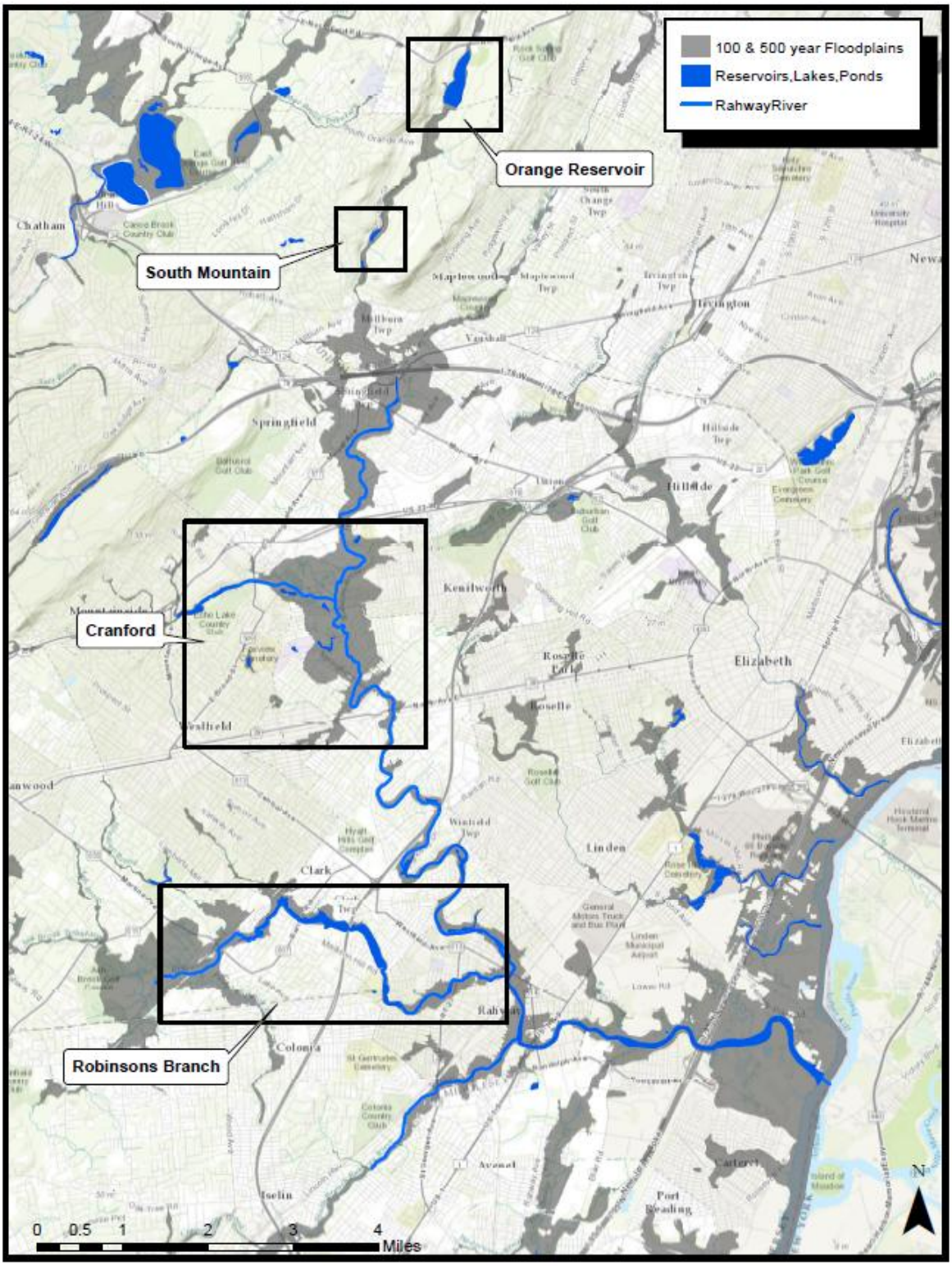
The U.S. Army Corps of Engineers (Corps), New York District (District), in partnership with the New Jersey Department of Environmental Protection (NJDEP) as the non-federal sponsor, is investigating the feasibility of implementing flood risk management measures along the Rahway River and its tributary, the Robinson's Branch, in the Townships of Cranford, Millburn and the City of Rahway in Union and Essex Counties, New Jersey (Figure 1).

The District was authorized under U.S. House of Representatives Resolution Docket 2548, dated March 24, 1998 to identify recommendations in the interest of water resources development, including ecosystem restoration. Accordingly, the Rahway River Basin Reconnaissance Study (USACE 1999) established Federal interest for providing flood risk management measures.

The District will be preparing an Environmental Impact Statement (EIS) to document the proposed action, alternatives formulated and evaluated, environmental effects, and any necessary mitigation to compensate for impacts from the proposed action. As part of the EIS development, the District is initiating public scoping. This Scoping Document was prepared in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality's *Guidance Regarding NEPA Regulations*, and the USACE's *Procedures for Implementing NEPA* (Environmental Regulations [ER]-200-2-2) for distribution to local, county, state, and Federal agencies that may have an interest in the impacts and benefits derived from implementation of flood risk management measures.

It should be noted that the Corps is also currently conducting a separate, Coastal Storm Risk Management Feasibility study in the lower, tidally influenced portion of the Rahway River. The Coastal Storm Risk Management Study was authorized under the Disaster Relief Appropriations Act of 2013 and is not part of this Scoping process.

Figure 1: Rahway River Basin Flood Risk Management Project Area



1.1 SCOPING

Scoping is the process used to identify issues, concerns, and opportunities for enhancement or mitigation associated with a proposed action. The purpose of the scoping process is as follows:

- Invite the participation of federal, state and local resource agencies, Indian tribes, non-governmental organizations (NGOs), and the public to identify significant environmental and socioeconomic issues related to the proposed project;

- Determine the depth of analysis and significance of issues to be addressed in the EIS;

- Identify how the project would or would not contribute to cumulative effects in the Rahway River Basin. This includes the identification of any federal, state, or local resource plans, and any future project proposals in the affected resource area and implementation schedules and any existing information and any data that would help to describe the past and present actions and effects of the project and other developmental activities on environmental and socioeconomic resources;

- Information, quantitative data, or professional opinions that may help define the geographic and temporal scope of the analysis (both site-specific and cumulative effects), and that helps identify significant environmental issues;

- Solicit, from participants, available information on the resources at issue, including existing information and study needs; and

- Identify any information sources that might be available to characterize the existing environmental conditions and analyze and evaluate impacts.

The District will be accepting comments, concerns and information related to the Scoping process through July 15, 2015.

1.2 STUDY WEBPAGE AND CONTACT INFORMATION

Additional information and updates as the Feasibility Study progresses is located at:

www.nan.usace.army.mil/Rahway

Questions about the overall Rahway River Basin Flood Risk Management Feasibility Study should be directed to:

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26 Federal Plaza, Room 2127, New York, NY 10279-0090
Phone: (917) 790–8215; Email: rifat.salim@usace.army.mil.

Written comments and suggestions concerning the scope of issues to be evaluated within the EIS to:
Kimberly Rightler, Project Biologist/NEPA Coordinator,
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2.0 STUDY DESCRIPTION/BACKGROUND

Flooding within the Rahway River Basin is caused principally by the rapid development of the area, which has resulted in a large increase of stormwater runoff into the Rahway River and its tributaries. The increased runoff coupled with inadequate channel capacities and bridge openings account for most of the flooding problems. Measures to reduce flood damages have been sought by local interests for many years. Storm events in the Rahway River Basin which caused significant damage are the storms of July 1938, May 1968, August 1971, August 1973, November 1977, July 1979, June 1992, October 1996, July 1997, Tropical Storm Floyd in September 1999, April 2007 and Tropical Storm Irene in August 2011.

At the beginning of the feasibility study, an assessment of the entire basin took place for the purpose of identifying all fluvial and tidal flood risk management problems and opportunities in the Rahway River Basin. The Initial Screening Report (2006) documented this assessment, and recommended further investigation in the Township of Cranford and the City of Rahway along the Robinson's Branch, two areas within the basin that experienced regular flooding in past storm events.

Subsequent of Tropical Storm Irene in August 2011, local stakeholders requested the District through the NJDEP to investigate potential flood storage opportunities outside/upstream of the Township of Cranford that would benefit not only Cranford but other municipalities as well. As a result, the Project Area was expanded to include the South Mountain Reservation and Orange Reservoir located in the Townships of Millburn and Maplewood and West Orange in Essex County.

2.1 CORPS CIVIL WORKS PLANNING PROCESS

The Corps planning process follows the six-step process defined in the "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies" (often called the "Principles and Guidelines", or P&G). The Principles and Guidelines define the Federal objective of Corps project planning, which is to contribute to national economic development consistent with protecting the nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements. The alternative with the greatest net economic benefit, often called the National Economic Development (NED) Plan, must be identified.

The six-step process is a structured approach to problem solving which provides a rational framework for sound decision making and is used for all planning studies conducted by the Corps of Engineers. Below further describes each step in the process.

Step 1: Identifying Problems and Opportunities: Define the study area, problems and opportunities, as well as study constraints, goals, and objectives. Because this is a flood risk management study, problems and opportunities are developed to address the Federal objective of National Economic Development (NED). Goals, objectives, and constraints are developed to provide potential solutions to reduce flood risk and achieve the opportunities within the confines of legislative authority, policies, and other restrictions.

Step 2: Inventory and Forecast Conditions: Develop an inventory and forecast of critical resources (physical, economic, social, environmental, etc.) relevant to the problems and opportunities under consideration in the study. This step also involves forecasting to predict what changes will occur to resources throughout the 50-year period of analysis, assuming no actions are taken to address the problems in the study area.

Step 3: Formulate alternative solutions (e.g. Flood Risk Management Alternatives). Alternative plans are formulated across a range of potential scales to demonstrate the relative effectiveness of various approaches at varying scales.

Step 4: Evaluate Effects of Alternative Plans: Alternative plans are evaluated for their potential results in addressing the specific problems, needs, and objectives of the study (e.g. flood risk management) compliance with environmental protection requirements, the P&G's four evaluation criteria (completeness, effectiveness, efficiency and acceptability) and other criteria deemed significant by participating stakeholders. Evaluation of the beneficial and adverse effects of the alternatives will provide a basis to determine which plans should be considered further, dropped or reformulated.

Step 5: Compare Alternative Plans: Alternative plans are compared to each other in terms of benefits (damages avoided), costs and net benefits of alternatives. Beneficial and adverse effects of each plan must be compared. These include monetary and non-monetary benefits and costs.

As part of the analysis, a Benefit Cost Ratio (BCR) is developed for each alternative. A BCR is based on estimated benefits, including damages prevented during modeled storm events, and estimated costs, including cost of initial construction and long-term operations and maintenance. This ratio is critical to determining whether a project would be economically justified and be implementable.

The plan that maximizes net benefits relative to other plans is identified as the National Economic Plan or NED Plan. A Locally Preferred Plan (LPP) may be requested by the non-Federal sponsor if they favor another plan over the NED Plan.

Step 6: Select Recommended Plan: Select the plan, (referred to as the Tentatively Selected Plan [TSP]) that best meets the study objectives and the four evaluation criteria in the P&G (completeness, effectiveness, efficiency, and acceptability). In the absence of a LPP, the TSP is identified as the NED Plan. A TSP, whether the NED Plan or a LPP, must have a Benefit Cost Ratio greater than one to be economically justified for Federal participation.

The Benefit-to-Cost Ratio is based on estimated benefits, including damages prevented during modeled storm events, and estimated costs, including cost of initial construction and long-term operations and maintenance. This ratio is critical to determining whether a project would be economically justified and be implementable. No action could be recommended if all alternatives have a BCR of less than one.

2.2 STUDY SCHEDULE

Tentatively Selected Plan	March 2016
Release of Draft Report/EIS	June 2016
Final Feasibility Report/EIS	January 2017
Chiefs Report (for Congress)	June 2017

3.0 ALTERNATIVES

As discussed in Section 2.0, the Project Area boundaries were increased to evaluate potential flood risk reduction opportunities within the Orange Reservoir and the South Mountain Reservation following a request by local stakeholders through NJDEP. In addition to their request, the local stakeholders presented several flood risk management alternatives utilizing these two areas for the Township of Cranford. As a result, the District conducted a preliminary alternative analysis to determine whether those alternatives that should be considered for further evaluation.

In total, nine flood risk management alternatives to address flooding in the Cranford and upstream areas were developed. Two public information sessions were held in Cranford and Millburn Townships in May 2014 to provide the public with status of the study and present to

them the preliminary alternatives for the Cranford area and upstream areas. Table 1 summarizes the preliminary alternatives for the Township of Cranford that were formulated and evaluated to be carried forward for further consideration.

In addition, a meeting was held in February 2014 with representatives from the City of Rahway and the NJDEP to discuss potential flood risk management alternatives within the City of Rahway. It was determined that the proposed plan identified in a General Reevaluation Report (GRR) prepared by the Corps in 1985 should be restudied and updated. A second alternative involving the use of the Middlesex Reservoir for flood storage was also discussed (Table 2).

Table 1. Cranford Preliminary Flood Risk Management Alternatives

Alternative	Status
1. Channel work and modification to Lenape Park Levees	Removed from further consideration due to BCR less than 1 and negative net excess benefits. *
2. Channel work and modification to the Nomehegan levees and Lenape Park	Removed from further consideration due to BCR less than 1 and negative net excess benefits. *
3. Channel work, dredging Orange Reservoir	Removed from further consideration due to BCR less than 1 and negative net excess benefits. *
4. Channel work and Orange Reservoir Modification	Carried forward for further consideration.
5. Channel work and South Mountain Regional Detention Basin	Removed from further consideration due to BCR less than 1 and negative net excess benefits. *
5a. Channel work and South Mountain Regional Detention Basin with relocation of Brookside Drive	Removed from further consideration due to BCR less than 1 and negative net excess benefits. *
6. South Mountain Regional Detention Basin.	Removed from consideration due to lack of public support.
6a. South Mountain Regional Detention Basin with relocation of Brookside Dr.	Removed from further consideration due to BCR less than 1 and negative net excess benefits. *
7a. Nonstructural-10-yr floodplain in Cranford	Carried forward for further consideration.
7b. Nonstructural-100-yr floodplain in Cranford	Carried forward for further consideration.
8. Lenape Park Detention Basin and Orange Reservoir Outlet Modification	Carried forward for further consideration.
9. Lenape Park Detention Basin, Orange Reservoir Outlet Modification and Channel Modification	Carried forward for further consideration.

* Refer to Step 5 in Section 2.1 for explanation of BCR.

Table 2. City of Rahway Preliminary Flood Risk Management Alternatives

Alternative	Status
1. Re-evaluation of GGR	Carried forward for further consideration.
2. Middlesex Reservoir	Carried forward for further consideration.

3.2.1 ALTERNATIVES TO BE SCOPED

3.2.1.1 No Action

The option of "No Action" must be considered as one of the alternatives for both the Township of Cranford and the City of Rahway in order to comply with the requirements of the NEPA. With the No Action Plan, it is assumed that no project would be implemented and forms the basis against which all other alternatives are measured.

3.2.1.2 Non-Structural

Non-structural measures will be considered for both Cranford Township and the portion of the City of Rahway along the Robinson's Branch.

Nonstructural features reduce flood risk by modifying the characteristics of the buildings and structures that are subject to floods or modifying the behavior of people living in or near floodplains. In general, nonstructural features do not modify the characteristics of floods nor do they induce development in a floodplain that is inconsistent with reducing flood risk. Some measures include removing buildings from floodplains by relocation or acquisition; flood proofing buildings; placing small levees, berms or walls around buildings; implementing flood warning and preparedness activities; and implementing floodplain regulation. The District is required to develop and present at least one action that is primarily nonstructural in nature. Nonstructural measures will also be considered for integration with structural features to maximize effectiveness of all alternatives. Following is a list of measures that will be considered:

Elevation

Elevation is the process of raising a structure so that the main living area (main floor) will be above design flood elevation. In most cases, the process involves separating a structure from its foundation, raising it on hydraulic jacks, and holding it in place with temporary supports while a new or extended foundation is constructed below. The result is the living area is raised and only the foundation remains exposed to flooding. The new or extended foundation may consist of continuous walls or separate piers, posts, columns or pilings.

Buy-Out or Acquisition

Buyout or acquisition results in the permanent removal or evacuation of the structure from the floodplain and is typically applied when other nonstructural measures are too costly. Buy-outs involve the acquisition of a property and its structures, either by purchase or by exercising the powers of eminent domain. Following acquisition, the structure and associated property development is either demolished or relocated. Acquired lands are typically restored to a natural condition and used for recreation or other purposes that would not be jeopardized by the flood hazard.

Flood Warning System

Flood warning systems may be utilized to warn property owners of impending floods, and therefore allow time to evacuate and relocate property subject to flood damage. Although a state-of-the-art flood warning system would increase the awareness of residents and allow for a more orderly evacuation, a warning system alone would not provide sufficient time to significantly reduce flood damages.

Floodproofing

Floodproofing is the process of making any combination of structural or nonstructural changes or adjustments incorporated in the design, construction, or alteration of individual buildings or properties in order to reduce flood damages. There are two categories of floodproofing: wet floodproofing and dry floodproofing.

Wet floodproofing refers to the protection of a building in a manner that allows floodwaters to enter and exit freely, in such a way that internal and external hydrostatic pressures are equalized. This equalization of pressures reduces the loads imposed on a structure and reduces the probability of structural damage or failure. Basement utilities subjected to flooding may be relocated to an above-grade utility room, where space permits, otherwise, the basement utilities may be surrounded by a watertight barrier.

Dry floodproofing is the process of protecting a building by sealing its exterior walls and by providing removable flood shields at structure openings to prevent the entry of floodwaters. Dry floodproofing is practical only for buildings with structurally sound walls and only where flood depths are low: no more than 2 to 3 feet for wood frame structures, or 3 to 4 feet for brick with masonry foundation walls.

Surface Periphery Floodwalls or Ringwalls:

For structures that are too large to elevate (generally in excess of a 2,000 SF footprint), a concrete wall or levee (ringwall) may be considered around the structure's property, where space and aesthetics permit.

Rebuilding

If the estimated cost of any other nonstructural alternative exceeds the estimated cost to demolish a structure and rebuild an equivalent structure, rebuilding the structure above the design flood elevation may be an economically viable nonstructural alternative.

3.2.1.3 Cranford Alternative 4: Channel Improvements and Orange Reservoir Outlet Modification

This plan includes approximately 15,500 ft. channel work throughout the extent of the Rahway River in Cranford Township, from Kenilworth Blvd, just downstream of Lenape Dam, to a point approximately 1,500 ft. downstream of the Lincoln Avenue Bridge (Figure 2). Approximately 1,400 ft. of the channel work is expected in Nomahegan Park. The downstream slope is approximately 2.6 ft./mile with a maximum deepening of about 3.7 ft. near Hansel Dam. The

new trapezoidal channel will consist of a combination of natural bed channel or riprap material, a 60 ft. bottom width with side slopes ranging from one vertical on two horizontal (1:2), to one vertical on two and a half horizontal (1:2.5). There will be approximately 2,000 ft. of new and removed/replaced retaining walls. Also, the Union Ave. and North Ave. Bridges will be removed and replaced.

This plan requires little to no dredging in the reservoir. There will be an installation of two additional 36 in. in diameter outlet pipes (Figure 3). The analysis requires the operation of the dam two days prior to a storm event for a drawdown between 10 ft. to15 ft. of the reservoir.

Figure 2: Cranford Alternative 4: Channel Improvements

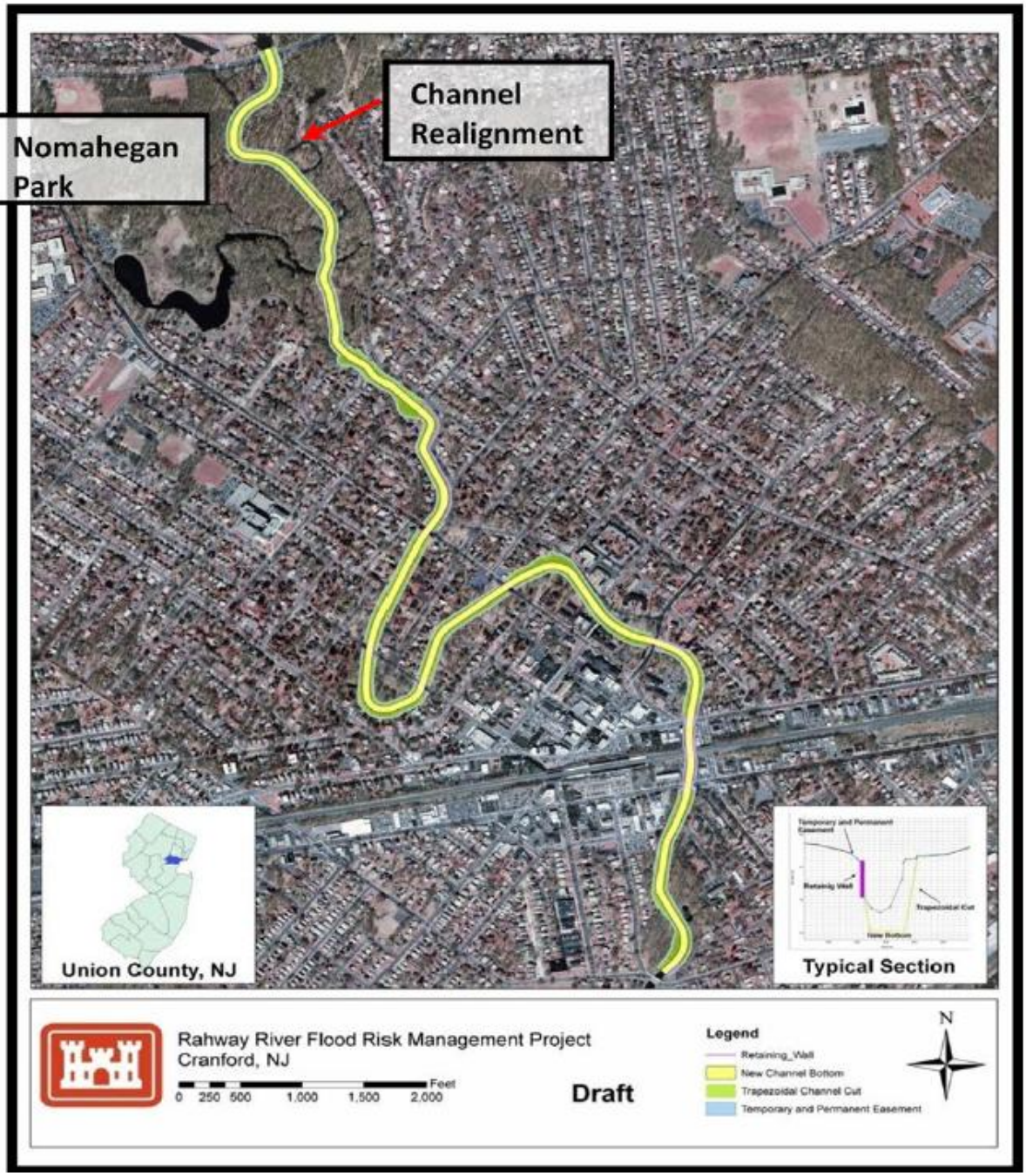
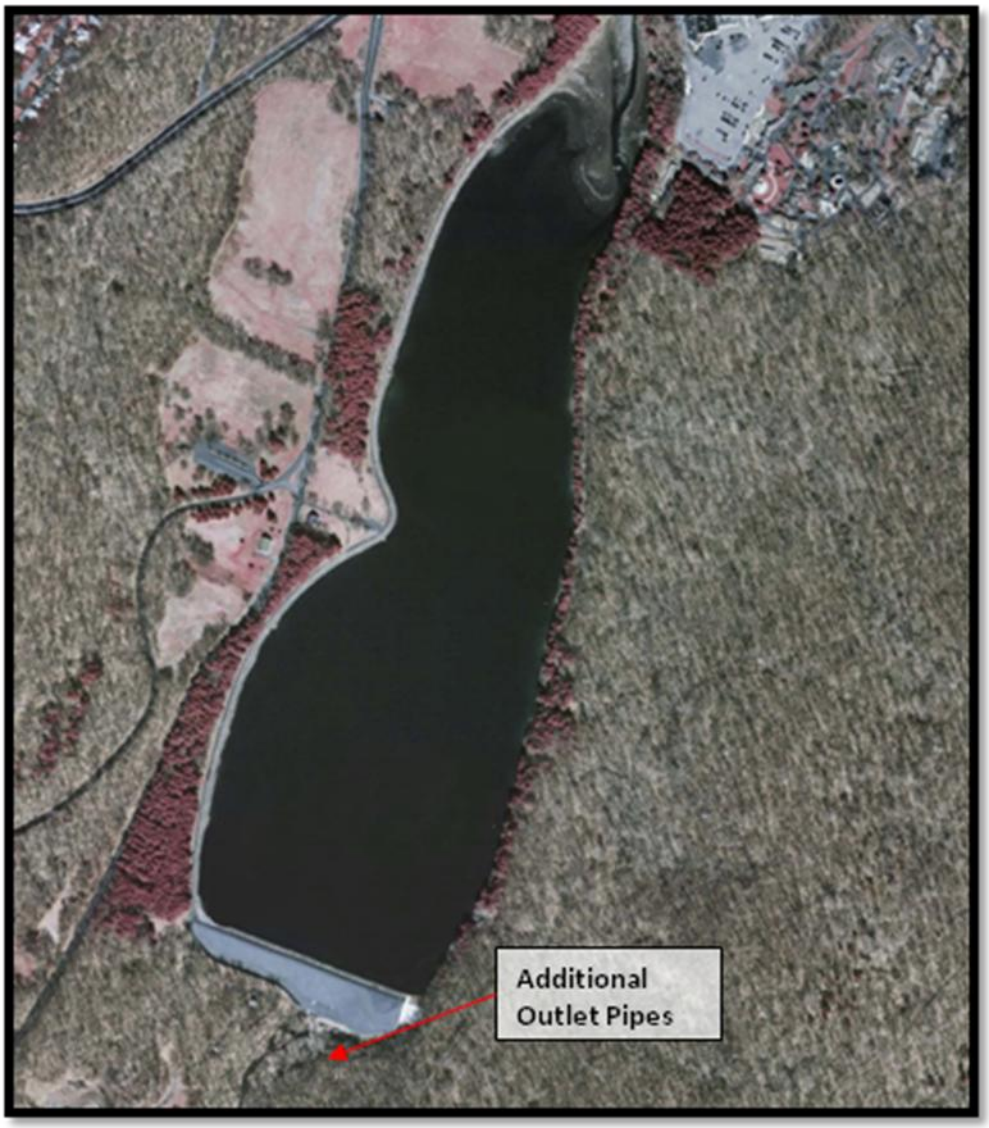


Figure 3: Cranford Alternative 4: Orange Reservoir Outlet Modification



3.2.1.4 Cranford Alternative 8: Modification to Lenape Park Dam and Orange Reservoir Outlet Modification

This plan includes the modification of the Lenape Park Dry Detention Dam to increase the water storage capacity in the basin. This modification will include three main components; (1) raising the existing Lenape dam structure and widening the orifice, (2) raising embankments 6 ft. above the existing, and (3) adding 6 ft. of floodwalls to the existing embankments in the northern area of Lenape Park near Fadem Rd. at Springfield Township.

As per Corps Engineering Technical Letter (ETL) 1110-2-583 *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment dams and Appurtenant Structures*, a minimum of 50 feet from the dam/embankment toe on either side of said dam/embankment must remain free of vegetation, particularly trees and shrubs. Within this vegetation free zone, only maintained grass is typically permitted.

In addition, the plan requires the installation of two additional 36 in. diameter outlet pipes in Orange Reservoir and operation of the dam two days prior to a storm event for a drawdown of about 10ft. to15 ft. from a maximum depth of about 30 ft. to a depth of about 15 feet (see Figure 3).

3.1.2.5 Cranford Alternative 9: Modification to Orange Reservoir and Lenape Park Dam, and Channel Improvements

This plan includes the modification of the Lenape Park Detention Dam to increase the water storage capacity in the basin. This modification will include three main components; (1) raising the existing Lenape dam structure and widening the orifice, (2) raising embankments 6 ft. above the existing, and (3) adding 6 ft. of floodwalls to the existing embankments in the northern area of Lenape Park near Fadem Rd. at Springfield Township.

As per Corps Engineering Technical Letter (ETL) 1110-2-583 *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment dams and Appurtenant Structures*, a minimum of 50 feet from the dam/embankment toe on either side of said dam/embankment must remain free of vegetation, particularly trees and shrubs. Within this vegetation free zone, only maintained grass is typically permitted.

In addition, the plan requires the installation of two additional 36 in. diameter outlet pipes in Orange Reservoir and operation of the dam two days prior to a storm event for a drawdown of about 10ft. to15 ft. from a maximum depth of about 30 ft. to a depth of about 15 feet (see Figure 3).

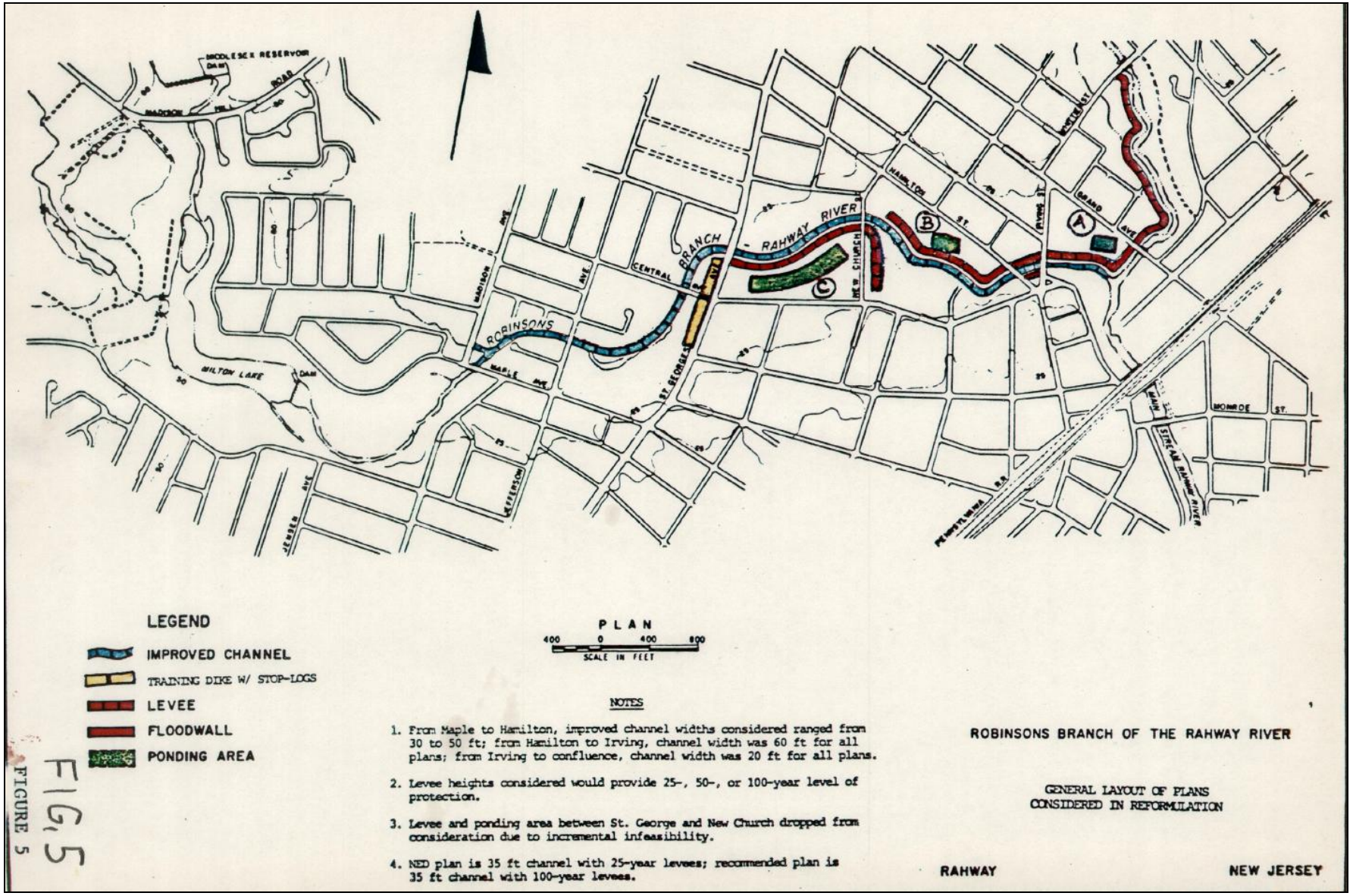
Some channel work is expected from Nomahegan Park to Lincoln Ave. Bridge. The extent and magnitude of the channel work will be determined in the coming months. The channel work may include deepening of up to 2.5 ft in the Hansel Dam area, minimizing the impact to the channel banks. Modification of Hansel and Droescher's Dam may be possible for this alternative. No bridge modification will be considered and a minimum use of retaining walls will be considered.

Figure 4: Cranford Alternative 9: Modification to Orange Reservoir and Lenape Park Dam, and Channel Improvements

3.1.2.6 Robinson's Branch Alternative 1: Re-evaluation of 1985 General Re-evaluation Report, Floodwalls/Levees and Channel Improvements

This District will re-evaluate the plan recommended in the 1985 General Re-evaluation Report (Figure 5) which includes approximately 6,500 ft of channel work involving modification of the Robinson's Branch to a 35 ft wide trapezoidal channel from Maple Avenue to the Robinson's Branch confluence with the Rahway River, approximately 6,600 ft of levees and floodwalls, approximately 750 ft of retaining walls and potentially three ponding areas.

Figure 5: Rahway Alternative 1: Re-evaluation of 1985 General Re-evaluation Report Plan



3.1.2.7 Robinson's Branch Alternative 2: Modification to Middlesex Reservoir

This plan will include the analysis of the storage available for flood risk reduction in the Robinson's Branch and possible modifications of the existing spillway and outlet. This alternative will require lowering the reservoir level prior to a storm event. This alternative might be analyzed in combination with the Robinson's Branch Alternative 1 or non-structural flood risk management measures.

4.0 ENVIRONMENTAL RESOURCES

This section briefly summarizes the major federal and state environmental laws, and federal executive orders (Tables 3-5) typically included as part of the EIS along with a brief description of some of the resources regulated under those laws and executive orders within the Project Area. The information presented in this section is not comprehensive, but presents general descriptions of some of the key environmental resources that are typically evaluated during the Feasibility Study. Additional environmental resources and specific environmental resource issues to be evaluated will be refined based on feedback from the Scoping Meeting, additional agency and public coordination and as alternative formulation and selection progresses.

Table 3. Federal Laws

Legislative Title U.S. Code/Other		Compliance
Clean Air Act (CAA)	42 U.S.C. §§ 7401-7671g	The General Conformity Rule of the CAA requires federal agencies to ensure that any federal actions occurring in areas designated as nonattainment or maintenance for any of the National Ambient Air Quality Standards do not interfere with a state's plans to meet national standards for air quality. As the Project Area is located in a region that is in non-attainment for ozone and carbon monoxide, an air quality analysis will be conducted to determine the level of project air emissions. Based upon the completed analysis, either a Record of Non-Applicability demonstrating that project emissions are considered to have an insignificant impact on the regional air quality, or a General Conformity Statement will be prepared. The analysis and corresponding document demonstrating compliance with the Clean Air Act will be included as an appendix to the EIS.
Clean Water Act	33 U.S.C. §§ 1251 et seq.	The Clean Water Act (CWA) is the principle law governing pollution control and water quality of the Nations' waterways, including wetlands. The objective of the CWA is to restore and maintain the chemical, physical and biological integrity of the Nations' waters. Sections of the CWA applicable to Corps Civil Works Projects include Sections 401 and 404. Compliance with this law includes preparation of a 404(b)(1) Evaluation which will be included as an appendix.
Endangered Species Act of 1973	16 U.S.C. §§ 1531 et seq.	The District will continue informal coordination with the U.S. Fish and Wildlife Service to comply with ESA requirements. Typical measures to avoid impacts to protect Indiana bat and Northern long-eared bat is to implement a tree clearing restriction of 1 April through 30 September.
Fish and Wildlife Coordination Act (FWCA)	16 U.S.C. § 661 et seq.	The FWCA requires Federal agencies to consult with the U.S. Fish and Wildlife Services and relevant state wildlife resources agencies whenever the waters of any stream or body of water are proposed or authorized to be modified (e.g. impounded, diverted, deepened, etc.). A Planning Aid Letter has been prepared by the USFWS for initial coordination purposes. Once a TSP is identified, the District will request the USFWS to prepare a FWCA Report to serve as compliance for this law. Both documents and associated correspondence will be included in an appendix in the EIS.
Migratory Bird Treaty Act (MBTA)		This law prevents the Typical compliance with this law requires a shrub and tree removal restriction to protect nesting migratory during construction. For the region in which the flood risk management measures are proposed, the typical restriction during which no woody vegetation may be removed occurs from 15 March through 31 July.

Legislative Title U.S. Code/Other		Compliance
National Environmental Policy Act of 1969	42 U.S.C. §§ 4321-4347	The circulation of the EIS will fulfill the requirements of this act. The draft EIS have public review period of a minimum of 45 days. The final EIS and draft Record of Decision will have a public review period of a minimum of 30 days.
National Historic Preservation Act of 1966	16 U.S.C. §§ 470 et seq.	Federal agencies are required to evaluate the effects of a proposed action on cultural and historic resources. The District will coordinate with the State Historic Preservation Office to fulfill requirements of this act. All correspondence and associated documents will be included as an appendix to the EIS.

Table 4: Federal Executive Orders

Executive Order Title	Date Executed	Compliance
Executive Order 11990, Protection of Wetlands	May 24, 1977	Federal agencies are required to minimize adverse impacts to wetlands and provide public disclosure of actions proposed in wetlands. Circulation of the EIS for public and agency review will fulfill the requirements of this order. Compliance with this EO including any mitigation requirements will be assessed and documented in the EIS.
Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	February 11, 1994	Federal agencies are required to identify and address the potential for disproportionately high and adverse environmental and human health effects on minority and low-income populations resulting from the agencies' programs, policies, and activities. According to EO 12898, minority populations exist where the percentage of minorities exceeds 50%, or where the minority population percentage in the affected area is meaningfully greater than in the general population. EO 12898 does not provide criteria to determine if an affected area consists of a low-income population. Based on a cursory analysis, the City of Orange, the owner of Orange Reservoir, has a minority population greater than 50% and a higher low income population than the County in which it is located (Essex County) and surrounding other municipalities. Therefore, if any alternative involving the Orange is selected as the NED or LPP, further evaluation analysis on Environmental Justice issues and additional coordination with the City of Orange will be conducted and documented in the EIS.

Executive Order Title	Date Executed	Compliance
Executive Order 13175 Consultation and Coordination with Indian Tribal Governments	November 6, 2000	Federal agencies are required to establish regular and meaningful consultation and collaboration with federally-recognized Tribes and recognizes a government-to-government relationship with federally-recognized Tribes.

Table 5: State Laws

State Law Title		Compliance
Water Quality Certification (WQC)	33 USC §1341; N.J.A.C. 7:13 (N.J.S.A 58:16A)052	Water Quality Certification (Section 401 of the CWA) is delegated to the State for review and approval of compliance with State water quality standards. Although a permit will not be applied for until project construction, compliance with this law including any mitigation requirements will be assessed and documented in the EIS.
Flood Hazard Area Control Act (FHACA)	N.J.S.A. 58:16A-50 (N.J.S.A. 13:8A	The FHACA regulates activity in flood hazard areas and includes the requirement of providing compensatory mitigation for removing woody vegetation within the riparian zone at a 2:1 ratio. As the Rahway River and Robinsonn's Branch are designated as FW2-NT waters, the regulated riparian zone width is 50 feet. Although a permit will not be applied for until project construction, compliance with this law including riparian mitigation requirements will be assessed and documented in the EIS.
Freshwater Wetlands Protection Act	N.J.A.C. 7:7A (N.J.S.A. 13:9B)	Regulates activities in state wetlands and surface waters (e.g. streams) and is associated with CWA Section 404. Although a permit will not be applied for until project construction, compliance with this law including any mitigation requirements will be assessed and documented in the EIS.
New Jersey Green Acres	N.J.A.C. 7:36	The Green Acres Program, provides funds for the State or local municipalities through financial assistance by the State, to acquire and maintain lands for the purposes of recreation. Compliance with this law including any mitigation requirements will be assessed during the Feasibility Study and documented in the EIS.

4.1 Water Resources

Surface Waters

Surface waters within the Project Area that may be subject to modification from flood risk management measures include the Rahway River and its tributary, the Robinson's Branch.

Originating in the Watchung Mountains in Essex County, the Rahway River flows south for approximately 24 miles before discharging into the Arthur Kill strait. The Rahway River has four major tributaries: the West Branch, the East Branch, South Branch and Robinson's Branch. The East Branch joins the West Branch just above the Study Area in Springfield Township, forming the mainstem of the River. The South Branch and Robinson's Branch then join the mainstem at the City of Rahway, where it flows until its confluence with the Arthur Kill.

The Rahway River and Robinson's Branch are designated as FW2-NT or freshwater river not supporting trout spawning or maintenance until the City of Rahway where it becomes tidally influenced (N.J.A.C. 7:9B 2008). By definition, designated uses for FW2 waters include: 1. Maintenance, migration and propagation of the natural and established biota; 2. Primary contact recreation; 3. Industrial and agricultural water supply; 4. Public potable water supply after conventional filtration treatment and disinfection; 5. Any other reasonable uses. Non-trout waters are those "not generally suitable for trout because of their physical, chemical or biological characteristics but are suitable for a wide variety of other fishes" (NJDEP, 2010).

Wetlands

An initial review of New Jersey's environmental mapping database (NJ GeoWeb) and the U.S. Fish and Wildlife Service National Wetland Inventory maps and state environmental mapping resources indicate a forested wetland complex runs along the Rahway River between Orange Reservoir and Campbell's Pond in the South Mountain Reservation and the presence of small, fragmented wetland complexes in various locations along several locations of the Rahway River and the Robinson's Branch within the Project Area. The majority of the Lenape and Nomahegan Parks are identified as forested wetlands.

4.2 Endangered and Threatened Species

The District has completed initial coordination with the U.S. Fish and Wildlife Service (USFWS) through the preparation of a Planning Aid Letter (PAL). Based on this initial coordination, the USFWS identified the Federally endangered Indiana bat (*Myotis sodalis*), and the Federally threatened northern long-eared bat (*Myotis septentrionalis*) and bog turtle (*Clemmys muhlenbergii*) as potentially occurring within the Project Area.

The USFWS also noted a known nest site of the bald eagle is located within 3 miles of the Project Area and suitable foraging areas exist throughout the Project Area. Although the bald eagle was removed from the Federal List of Endangered and Threatened Widlife in 2007, the bald eagle remains protected through the BGEPA and the Migratory Bird Treaty Act.

In addition, the USFWS is currently evaluating the little brown bat (*Myotis* lucifugus), tri-colored bat (*Perimyotis subflavus*) and American eel to determine if listing under the Endangered

Species Act (ESA) is warranted. A decision on whether to list the American eel is anticipated in September 2015.

The PAL included a list of state endangered, threatened and special concern species that may occur within the Project Area which are listed in Table 6. Further coordination with the USFWS and State E&T will occur as the Feasibility Study progresses.

Table 6: New Jersey State Listed Endangered, Threatened and Special Concern Species

Latin Name	Common Name	Listing Status
Accipter gentilis	Northern goshawk	Endangered
Asio flammeus	Short-eared owl	Endangered
Haliaeetus leucocephalus	American bald eagle	Endangered
Podilymbus podiceps	Pied-billed grebe	Endangered
Ammodramus savannarum	Grasshopper sparrow	Threatened
Bubulcus ibis	Cattle egret	Threatened
Buteo lineatus	Red-shouldered hawk	Threatened
Dolichonyx oryzivorus	Bobolink	Threatened
Eremophila alpestris	Horned lark	Threatened
Falco sparverius	American kestrel	Threatened
Melanerpes erythrocephalus	Red-headed woodpecker	Threatened
Nycticorax nycticorax	Black-crowned night heron	Threatened
Pandion haliaetus	Osprey	Threatened
Strix varia	Barred owl	Threatened
Accipiter cooperii	Cooper's hawk	Special Concern
Accipiter striatus	Sharp-shinned hawk	Special Concern
Ardea herodias	Great blue heron	Special Concern
Chordeiles minor	Nighthawk	Special Concern
Egretta caerulea	Little blue heron	Special Concern
Plegadis falcinellus	Glossy ibis	Special Concern
Sturnella magna	Eastern meadowlark	Special Concern

Source: USFWS, 2015

4.3 Cultural Resources

The District has conducted preliminary investigations to identify potentially significant cultural resources within the study area of the proposed Rahway River Flood Control Project, with a focus on the Area of Potential Effect for alternatives for the Township of Cranford and the City of Rahway. A review of historic maps was undertaken at the New Jersey State Library and research on previous surveys and documented archaeological sites was undertaken at the New Jersey State Historic Preservation Office (NJSHPO) and the New Jersey State Museum (NJSM).

Since the 1970's the study area and its vicinity has been the subject of a number of cultural resources surveys. The New York District conducted an archaeological and historical survey in 1977 (Kraft 1977). The study area in 1977 was smaller in scope from what it is today. The project focused mainly on the area of the River south of Nomahegan Park, ending at the Garden State Parkway. At the time, project plans included channelization for the entire length of the River, replacement of the Hansel dam, levees and flood walls at certain locations, replacement of several bridges and modifications to the Droescher's Mill. A pedestrian survey and limited archaeological investigations were carried out in areas of proposed disturbance. The survey found no evidence of prehistoric sites in the area but there were two historic sites, Crane's Mill and the Droescher's Mill and dam, which were believed to be threatened by their proximity to the proposed project elements.

Two investigations, both conducted in the 1980s, are relevant for the Robinson's Branch project area. They include the 1983 reconnaissance of the original flood control project and the documentation of the Carriage Factory Site (Raber et al 1988) both of which covered a portion of the current project area. The 1983 study focused on 15 areas designated as archaeologically sensitive based on topography and landform characteristics. This survey identified a 19th century carriage factory complex on the north bank of the Rahway River. The carriage factory was subsequently studied in 1988, by which time much of the main factory building had collapsed or was demolished. Additional investigations have looked at the elements of the Union County Park System within the project area documenting elements associated with the Olmsted Brothers Landscape Architects, as well as the numerous bridges that cross this stretch of the river (Dietrich 2004, Cinquino et al 2002, Nolte et al 2013; Lichtenstein and Associates 1994; NJDOT 2001).

The site files at the New Jersey State Historic Preservation Office list two National Register of Historic Places (NRHP) listed properties and four eligible properties within the APE project area. There are five additional NRHP listed or eligible properties with one mile of the project area (Table 7). A search of the site files at the New Jersey State Bureau of Archaeology at the New Jersey State Museum identified four archaeological sites within the study area and another site approximately 500 feet outside the study area. These are listed below in Table 8.

Table 7: State and National Register Eligible and Listed Historic Sites for both the Township of Cranford and City of Rahway

Property Name	SR/NR Status	Proximity to Area of Potential Effect
Rahway River Park Historic District (includes Rahway River Parkway, Rahway River Park, Milton Lake Park, Bezega Park/Allen Conservation Area as contributing elements to the Historic District.	SR/NR Eligible	Within APE
Upper Rahway Historic District	SR/NR	Within APE
Regina Historic District	SR/NR	Within APE
Pennsylvania Railroad Historic District	SR/NR	Within APE
Union County Park System Historic District		
North Cranford Historic District	NR Eligible	Within APE
Modification to North Cranford Historic District – Hanson House	NR Eligible	Within APE
Droescher's Mill	SR/NR	Within APE
Central Railroad of New Jersey Mainline Historic District	NR Eligible	Within APE
Crane-Phillips House	SR/NR	Within APE
Rahway Theater/"Arts District"	SR/NR	Within APE
Historic Cemeteries – Rahway Cemetery (18th C to present), Hazel Wood Cemetery and Old Church Cemetery (both 19th C to present)	Potentially eligible	Within and adjacent to the APE
Staten Island Railroad	NR Eligible	1000 feet
Garden State Parkway Historic District	NR Eligible	0.37 miles
Baltustrol Golf Club	SR/NR	0.37 miles
Oswald Nitschke House	SR/NR	0.37 miles
Caldwell Parsonage	SR/NR	0.72 miles

Table 8: Archaeological Sites

Archaeological Site	Description	Proximity to Study Area
28-UN-7 "Cranford"	Prehistoric, Archaic point, surface find	Within study area
28-UN-4	Historic Saw Mill "Cranes Mill"	Within study area
28-UN-5	Historic Grist Mill	Within study area
28-UN-12 "Springfield"	Prehistoric, stone point, surface find.	500 feet

4.4 Environmental Contamination

As required by the Corps Engineering Regulation 1165-2-132 (Hazardous, Toxic and Radioactive Waste Guidance for Civil Works, 26 June 1992), an assessment of hazardous, toxic, and radioactive waste (HTRW) will be conducted in the project area. Hazardous, Toxic, and Radioactive Waste (HTRW) are defined as any "hazardous substance" regulated under Comprehensive, Environmental Response, Compensation, Liability Act (CERCLA), 42 U.S.C. 9601 et seq, including "hazardous wastes" under Section 3001 of the Resources Conservation and Recovery Act (RCRA), 42 U.S.C. 6921 et seq. The District will conduct a file searches utilizing the the NJDEP "Known Contaminated Sites" list (KCS) and US Environmental Protection Agency data bases, including the National Priority List (NPL), the Comprehensive Environmental Response, the Compensation and Liability Information System (CERCLIS), the Toxic Release Inventory System (TRIS), and the Resource Conservation and Recovery Information System (RCRIS). Field investigations may be conducted once the NED plan is identified.

4.5 New Jersey Green Acres Lands

Under the Green Acres program, lands obtained or developed with Green Acres funding and lands held by a local government for recreation and conservation purposes must permanently remain in use for such purposes. In general, lands subject to the rules of the program cannot be disposed of or diverted unless it can be demonstrated to the State that the modification will protect or enhance the use of the area. By definition, land that is used for purposes other than recreation and conservation is considered a "diversion" while a "disposal" is the selling, donating, or some other form of permanent transfer of possession of parkland.

Construction of structures including flood risk management measures may constitute as a diversion and could require some form of compensation in the form of replacement land, parkland improvements or compensatory funding.

A review of the Green Acres Program Open Space Database indicates the following locations within the Project Area of which all or portions of were acquired with Green Acres Program funds and are within the footprint of flood risk management alternatives being evaluated.

- South Mountain Reservation, Millburn and Maplewood Townships, West Orange
- Lenape Park, Cranford Township
- Hanson Park/Canoe Club, Cranford Township
- McConnell Park, Cranford Township
- Sperry Park, Cranford Township
- Rahway River Parkway, Cranford Township
- Nomahegan Park, Cranford Township
- Milton Lake Park, City of Rahway
- Arts Center Park, City of Rahway
- Kiwanis Park, City of Rahway

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