Public Information Meeting for: Mamaroneck & Sheldrake Rivers Basin Village of Mamaroneck

Flood Risk Management Study

Mamaroneck & Sheldrake Rivers
General Reevaluation Report

25 February 2016

US Army Corps of Engineers
New York District
BUILDING STRONG

Overview of Presentation:

- Study Authority & Introduction
- Flooding Impacts
- Alternatives Assessed
- Proposed Plan
  - Optimization & Details
  - Environmental Impacts
- Next Steps

Mamaroneck & Sheldrake Rivers Basin Flood Risk Management

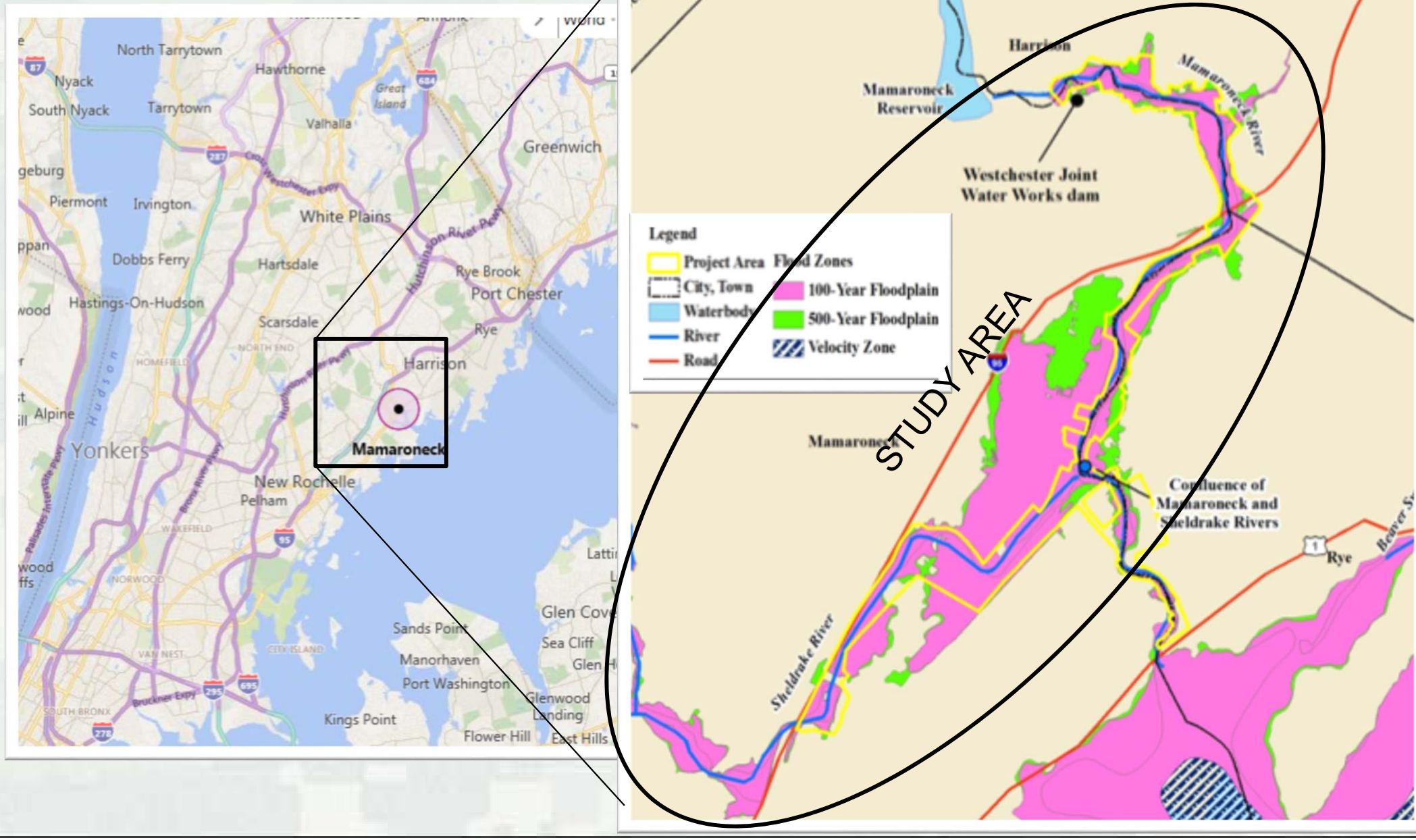
The U.S. Army Corps of Engineers conducted a feasibility study and completed the Feasibility Report for Flood Control, Mamaroneck and Sheldrake Rivers Basin and Byram River Basin in October 1977. A plan was authorized for construction on November 17, 1986 in Section 401(a) of the Water Resources Development Act (WRDA) (PL 99-662, 99th Congress, 2nd Session).

Mamaroneck & Sheldrake Rivers Basin Flood Risk Management

Non-Federal Partners

- New York State Department of Environmental Conservation (NYSDEC)
  - NYSDEC partnered with Westchester County to cost-share the study costs
- The Village of Mamaroneck is the local stakeholder
- Construction to be cost-shared 65% Federal and 35% non-Federal in accordance with a Project Partnership Agreement to be executed upon Study approval

Mamaroneck & Sheldrake Rivers Basin Flood Risk Management



Mamaroneck & Sheldrake Rivers Basin Flood Risk Management

Problems:

Flooding and repetitive losses that cost millions and endanger citizens

- Small bridge openings
- Inadequate channel flow capacity
- Channel constrictions and severe bends
- Fully developed floodplain

Opportunities:

Reduce flood risk to residents, property, and infrastructure as well as economic losses to region and nation

- Increase flows through channels (deepening and widening)
- Increase protections to keep water in channels (walls)
- Relocate valuable infrastructure from the risk (elevate/floodproof)

Mamaroneck & Sheldrake Rivers Basin Flood Risk Management

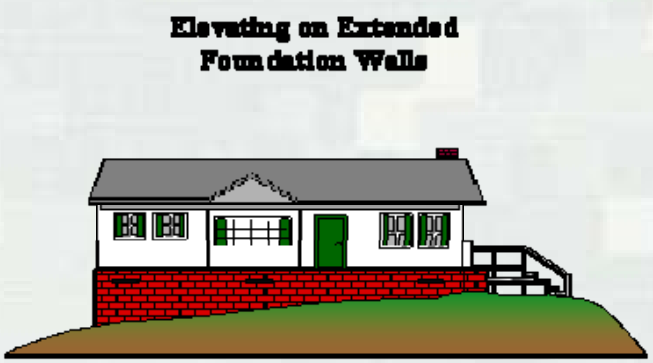
Images from April 2007 Flood

Mamaroneck & Sheldrake Rivers Basin Flood Risk Management

Measures:

Structural

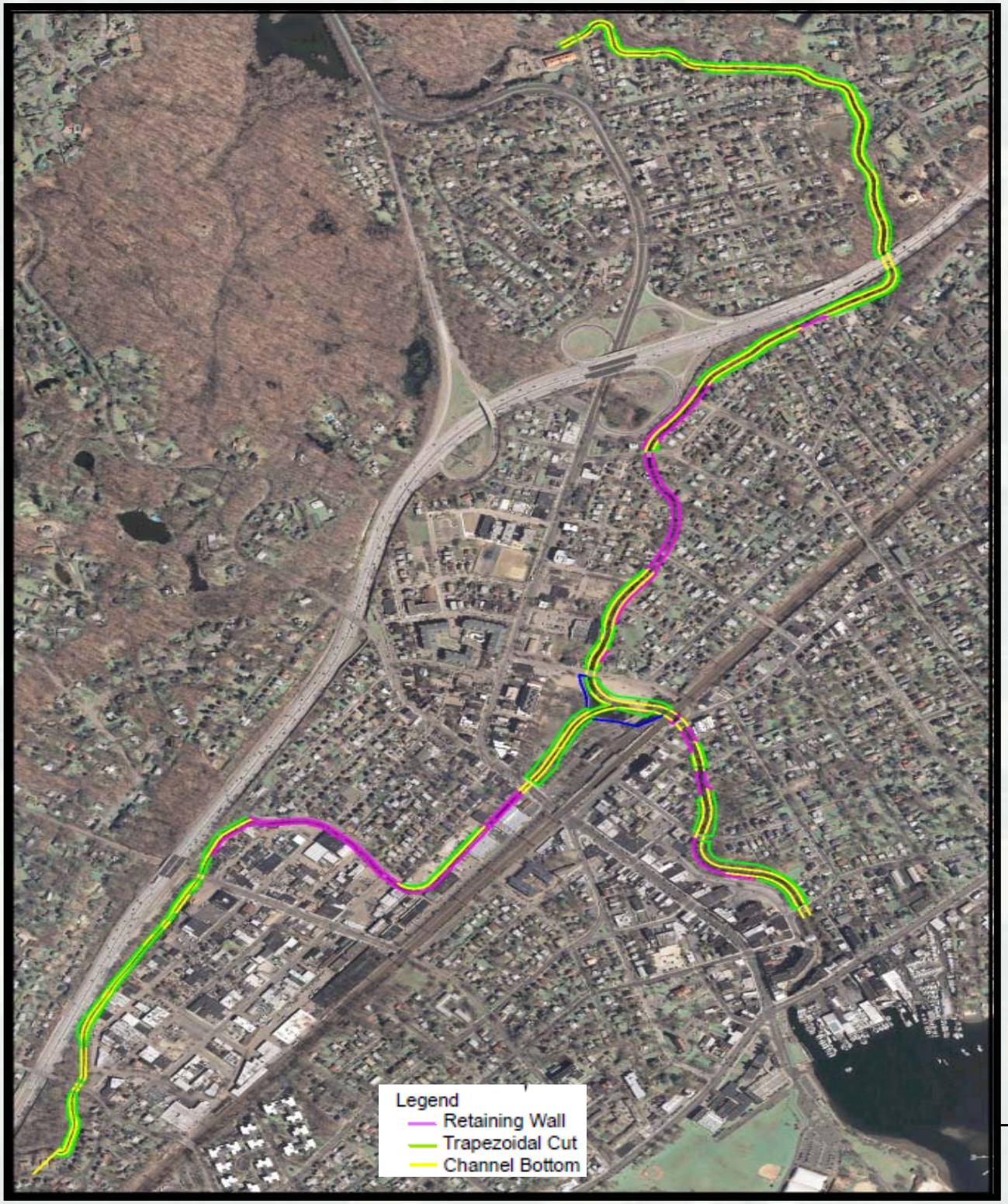
- Floodwalls
- Levees
- Retaining walls
- Diversions
- Channelization
- Bridge modification



Non-Structural

- Buyouts
- Reservoir management
- Evacuation/flood warning
- Structure elevation
- Wet/Dry floodproofing

Alternative Analysis



Mamaroneck and Sheldrake Rivers Basin Flood Risk Management

Alternative 1, 2, 3 and 5

- Channel deepening and widening along both the Mamaroneck & Sheldrake Rivers
- Bridges modified or replaced
- Realignment of the confluence

Alternative 1: Confluence only

Alternative 2: Alternative 1 plus upstream on Mamaroneck River

Alternative 3: Alternative 2 plus upstream on the Sheldrake River

Alternative 5: Ward Avenue Tunnel

Mamaroneck and Sheldrake Rivers Basin
Flood Risk Management

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Mamaroneck and Sheldrake Rivers
Flood Risk Management Study
Alternative #4

0 250 500 1,000 1,500 2,000 Feet

N

Legend
- Tunnel
- Retaining Wall
- Channel Bottom
- Trapezoidal Cut
- Regrade

Alternative 4: 1986 Authorized Plan

- Corps guidance requires the reevaluation of the authorized plan
- Consist of a tunnel system running beneath Fenimore Rd. from the Sheldrake River to the West Basin of Mamaroneck Harbor.
- Includes channel work in the Mamaroneck River
- The authorized plan was never constructed because of funding issues. Authorized in WRDA 1986 for $68.5M ($156.5M at FY15 price levels - the 2016 recommend plan is half the cost of the originally authorized plan)

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Alternative 6: Non-structural (Analysis of 100-year, 10-year, and 2-year)

Frequency Event	# Houses Inside Floodplain	# Houses requiring Non-structural Action	# Houses Flooded at First Floor
100-year	632	363	269
10-year	298	210	88
2-year	116	59	57

Alternative 7: Non-structural Combination with Structural – deferred due to requests for Alternative 8

Alternative 8: Reservoir & Bridge Modification

- This alternative was subdivided by parts:
  - Alt #8a: a larger Mamaroneck Reservoir with modifications to the Water Works Dam
  - Alt #8b: a larger Sheldrake Lake/Larchmont Reservoir with modification to the dam
  - Alt #8c: Bridge Modifications and/or Removal plan
  - Alt #8d: Combination of all the above Plans
  - Alt #8e: Plan 8d plus other small storage area changes

National Economic Development (NED) PLAN SELECTION PROCESS

Preliminary Alternative Analysis

Alternative	Stream/Benefit Source	Annual Benefits	Total Investment Cost	Total Annual cost	Net Excess Benefits	BCR
Alt 1	*Mamaroneck & Sheldrake Rivers confluence*	*$3,291,780*	*$54,434,000*	*$2,724,300*	*$567,500*	***1.2***
Alt 2	*Confluence & Upstream Mamaroneck*	*$3,839,670*	*$72,705,000*	*$3,625,400*	*$214,300*	***1.1***
Alt 3	*Confluence & Mamaroneck and Sheldrake Rivers*	*$4,403,940*	*$95,961,000*	*$4,772,100*	*-$368,200*	***0.9***
Alt 4	*1986 Authorized Plan - Tunnel*	*$4,578,450*	*$154,481,000*	*$7,715,400*	*-3,137,000*	***0.6***
Alt 5	*Ward Avenue Tunnel*	*$3,750,350*	*$91,151,000*	*$4,529,300*	*-$779,000*	***0.8***
Alt 6	*Nonstructural*	*$2,705,690*	*$86,082,000*	*$4,007,100*	*-$1,301,400*	***0.7***
Alt 7	*Replaced by Alternative 8*	-	-	-	-	-
Alt 8	*Bridge and Reservoir Modifications*	*$2,925,550*	*$79,178,000*	*$3,979,300*	*-$1,053,800*	***0.7***

***Listed Costs these costs are the unoptimized costs for preliminary cost comparison used during alternative analysis

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Tentatively Selected Plan: Alternative 1

- Optimization included iterations of Alternative #1

Alternative	Summary
Alt 1	Original as described
Alt 1S – Small	Reduced # of bridge modifications
Alt 1M – Medium	Increased channel work
Alt 1L – Large	Most bridge modifications and increased amount of channel work
Alt 1F – "Final"	Combination of 'best bang for the buck' features
Alt 1Z – Hybrid (1F & 1M)	Recombination with maximized annual benefits

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The Plan that maximizes annual net benefits is identified as the **National Economic Development Plan (NED)**

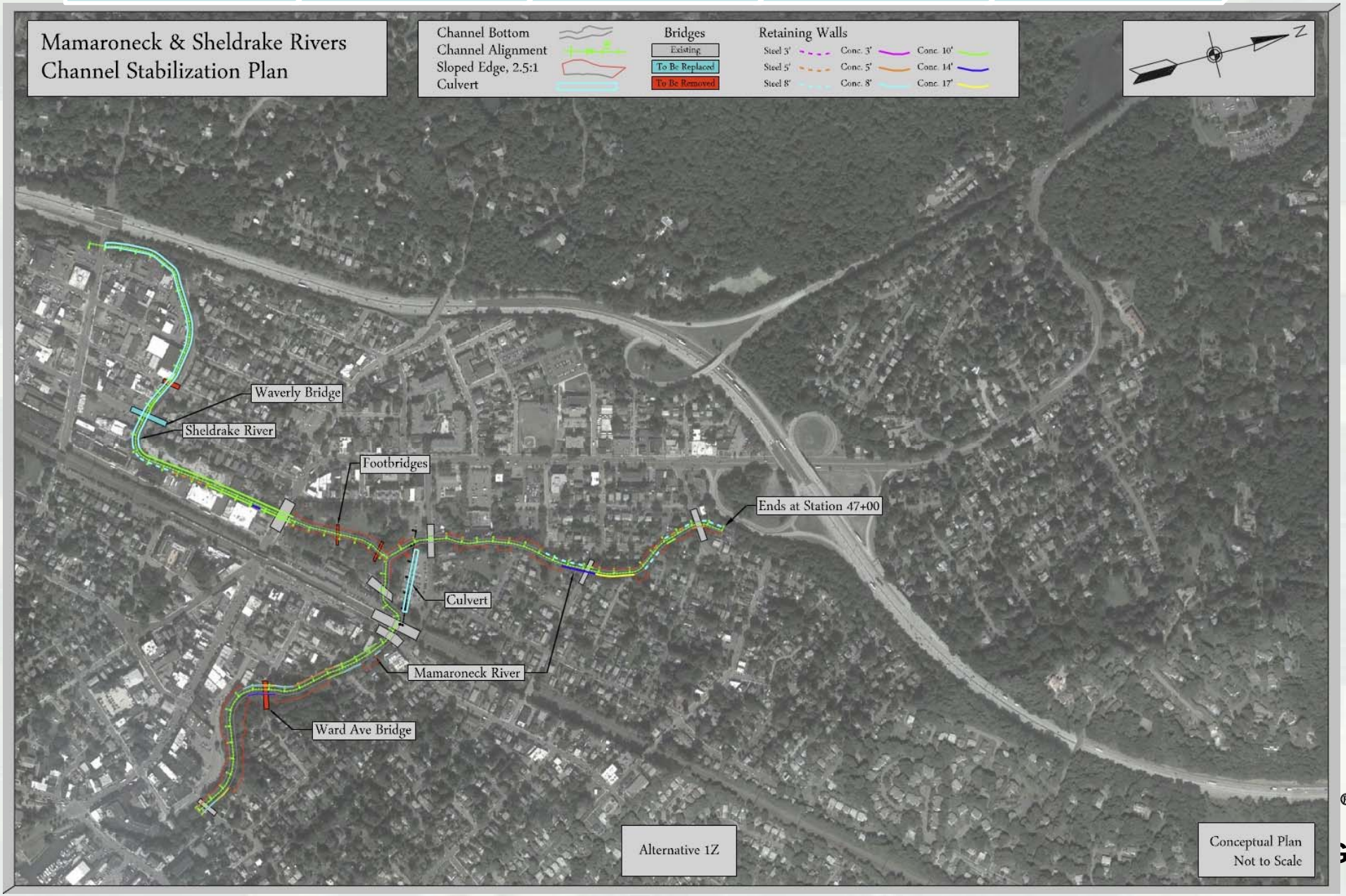
Alternative 1Z

- Channel deepening and widening along both the Mamaroneck & Sheldrake Rivers
- Removal of Ward Avenue Bridge
- Removal and replacement of Waverly Avenue Bridge
- Removal of 2 footbridges at Columbus Park and Centre Avenue footbridge
- By-Pass diversion culvert at confluence
- Non-structural solution in Harbor Heights reach

Federal Project Cost (65%)	**$45,306,675**
Non-Federal Project Cost (35%)	**$24,395,902**
Total Project Cost (100%)	**$69,702,577**

Mamaroneck & Sheldrake Rivers Basin Flood Risk Management

Authority & Introduction | Flooding Impacts | Alternatives Assessed | **Proposed Plan** | Next Steps



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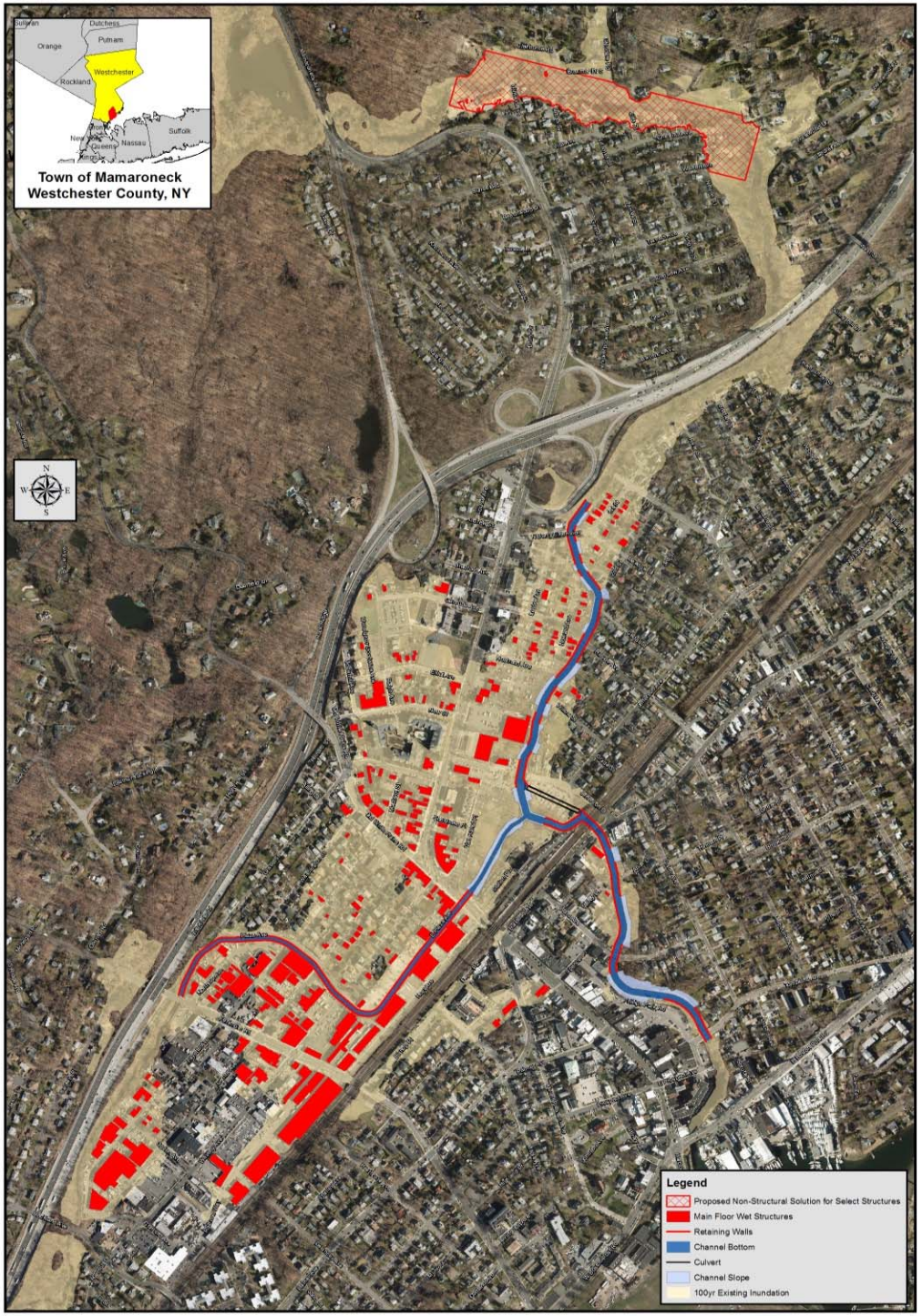
The NED Plan – Alternative 1Z

- Estimated to reduce damages by $3.2 million annually
- 86% reduction (percent risk) in main floor flooding of structures
- Provides an approximate 4.6 foot reduction at the confluence near the Columbus Park area
- Provides an approximate 2.8 foot reduction along the Sheldrake River
- Provides a 0.4 foot reduction in the Harbor Heights Subdivision plus an additional non-structural solution (floodproofing and/or elevation)
- Addresses failing retaining walls

Will not eliminate all flooding and residents must continue to follow evacuation protocols



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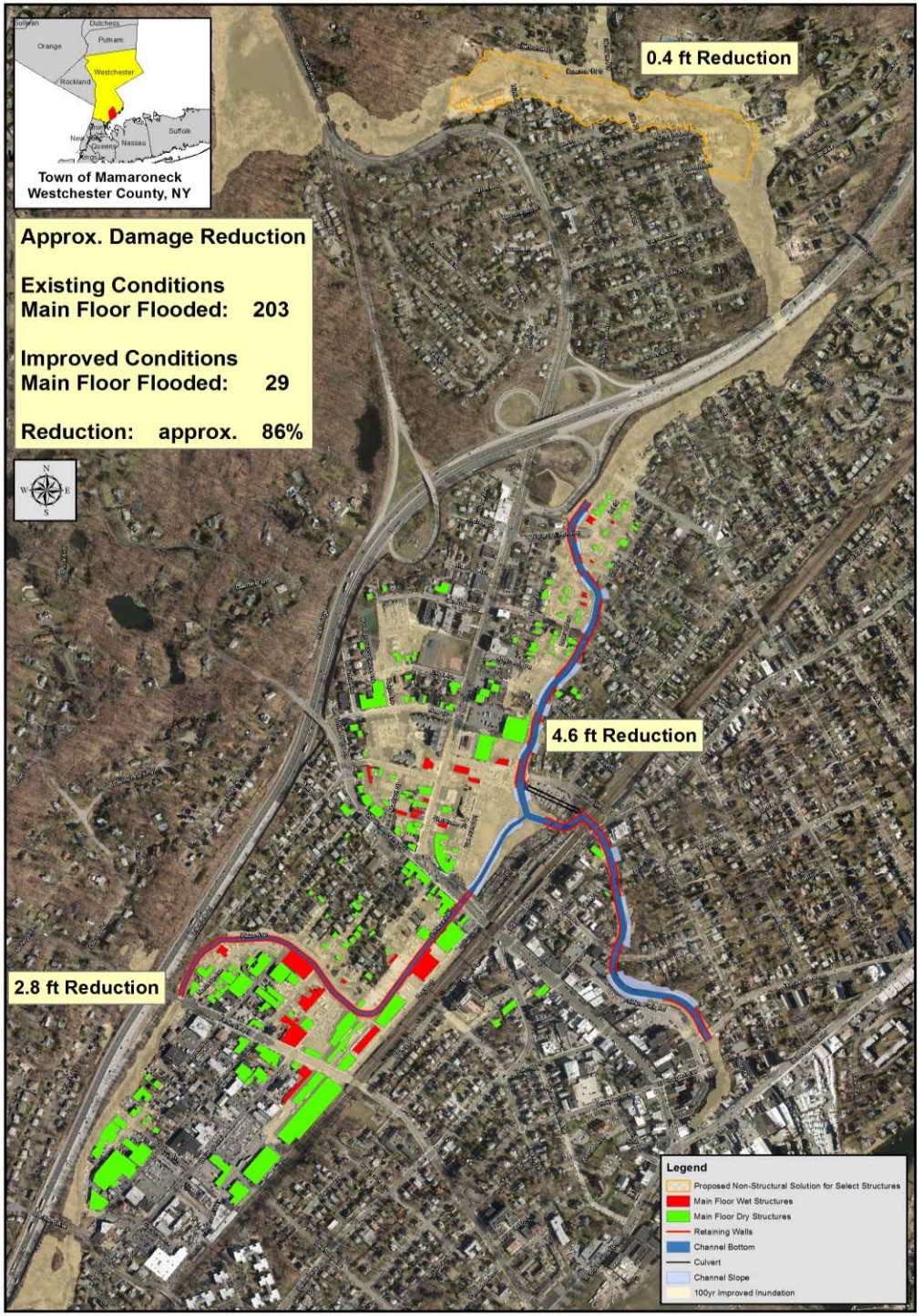
1% Annual Risk of Flooding (100 YR)
Mamaroneck & Sheldrake
Westchester County, NY
October 2015

0 250 500 750 1,000 Feet



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New York District

1% Annual Risk of Flooding (100 YR) - Alternative #1Z
Mamaroneck & Sheldrake
Westchester County, NY
October 2015

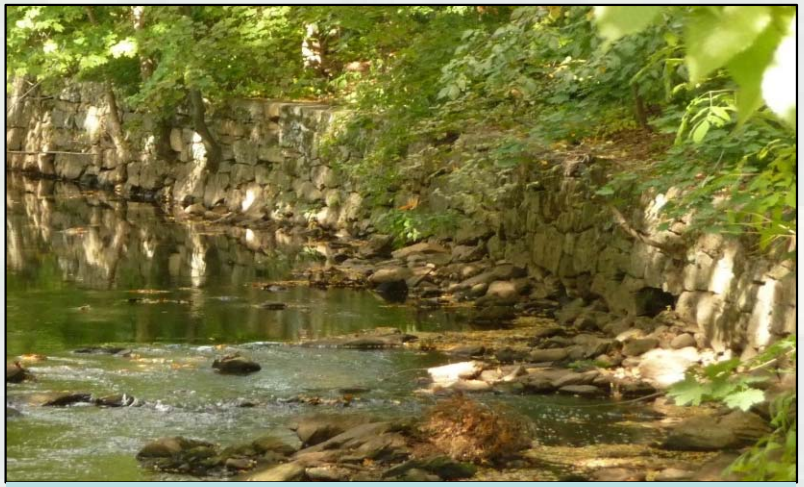
0 250 500 750 1,000 Feet

Mamaroneck & Sheldrake Rivers Basin Flood Risk Management

Environmental Compliance on NED Plan:

A Draft Environment Impact Statement has been prepared

- Historic Properties: Ward Avenue Bridge and Works Project Administration (WPA) stone retaining walls
  - Draft Memorandum of Agreement under review by New York State Historic Preservation Office and others
- Potential for Indiana and Northern Long Eared Bat habitat
  - Implementation of a tree cutting window – no tree cutting between 1 April and 1 August to avoid impacting the bats during roosting season.
- Freshwater Fish and American Eel
  - Avoidance of in-channel water work from 1 June through 1 September
- NYSDEC/Village permits required for NED Plan



Walls upstream of Hillside Avenue Bridge

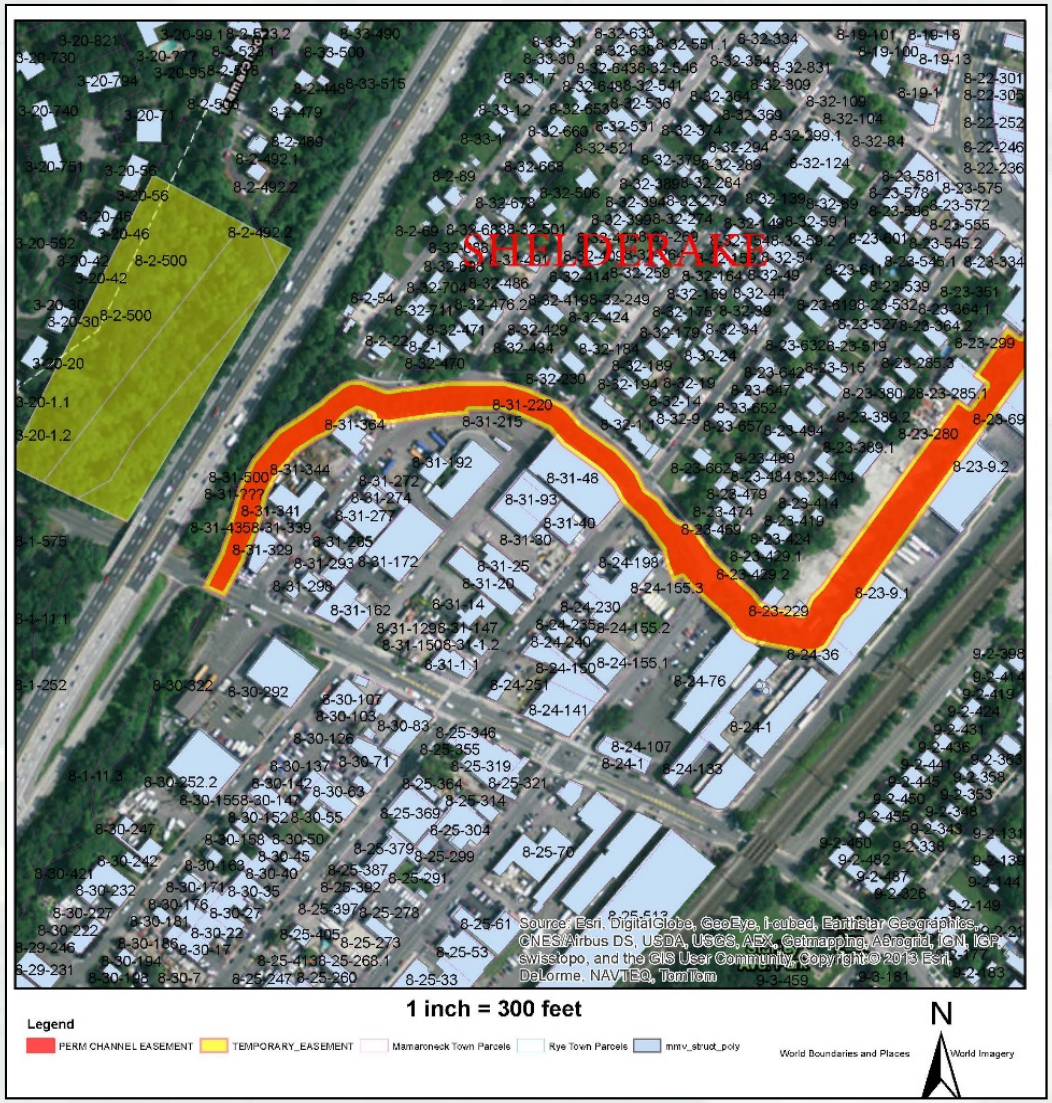
Upstream side of Ward Avenue Bridge

Mamaroneck & Sheldrake Rivers Basin Flood Risk Management

Real Estate Requirements on NED Plan:

- Temporary and Permanent easements will be required (obtained by the Sponsor)
- Do not expect to have to acquire property at this time

Easement Type	Acres	Parcels Required	Purpose
Channel Improvement Easement	14 acres	96	Permanent channel modification easements
Temporary Easement	8	83	Construction work area easements



Mamaroneck & Sheldrake Rivers Basin Flood Risk Management

Study Schedule:

Final Draft Report/DEIS **Released for public review** **Released for Corps HQ review**	**22 Jan 2016**
DEIS public information meeting	**25 Feb 2016**
Public Review period closes	**14 Mar 2016**
Final Report/EIS submitted to Corps HQ	Sep 2016
Chiefs Report	Early 2017
Plans & Specifications Development (assumes Congressional Authorization in 2017)	Late 2018
Ground Breaking (duration approximately 2 years)	Late 2018

Mamaroneck & Sheldrake Rivers Basin Flood Risk Management

- Fill out Comment Cards
- Ask Questions in the Lobby
- Public Comment Period Closes 14 March 2016
  - All Comments are Encouraged
  - Comments should be submitted via email to Matthew Voisine, Project Biologist at:

    Matthew.Voisine@usace.army.mil
  - Comments can be submitted via mail to:

    Matt Voisine

    US Army Corps of Engineers, New York District

    26 Federal Plaza, New York, New York 10278-0900

Mamaroneck & Sheldrake Rivers Basin Flood Risk Management

- All study documents may be found at:

http://www.nan.usace.army.mil/Missions/CivilWorks/ProjectsinNewYork/MamaroneckandSheldrakeRivers.aspx

Comments provided will become part of the public record for this EIS. Comments submitted will be fully considered during the preparation of the final EIS. All written comments, including names and address, will be made a part of the administrative record, available to the public under the Freedom of Information Act (FOIA). The Administrative Record, or portions thereof, may also be posted on a Corps of Engineers internet web site.