Passaic River Main Stem Flood Risk Management Project
Preliminary Alternative Analysis Report

Briefing to Elected Officials

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New Jersey Department of
Environmental Protection

Passaic River Briefing

- Purpose of Briefing
- Summary of Report
- Phase 1 – Preliminary Alternatives Analysis
  - Objective
  - Review of Alternatives
    - Plan descriptions
    - Issues
  - Costs & Benefits
- Phase 2 – Detailed Analysis
  - Selected alternatives
  - Public meetings

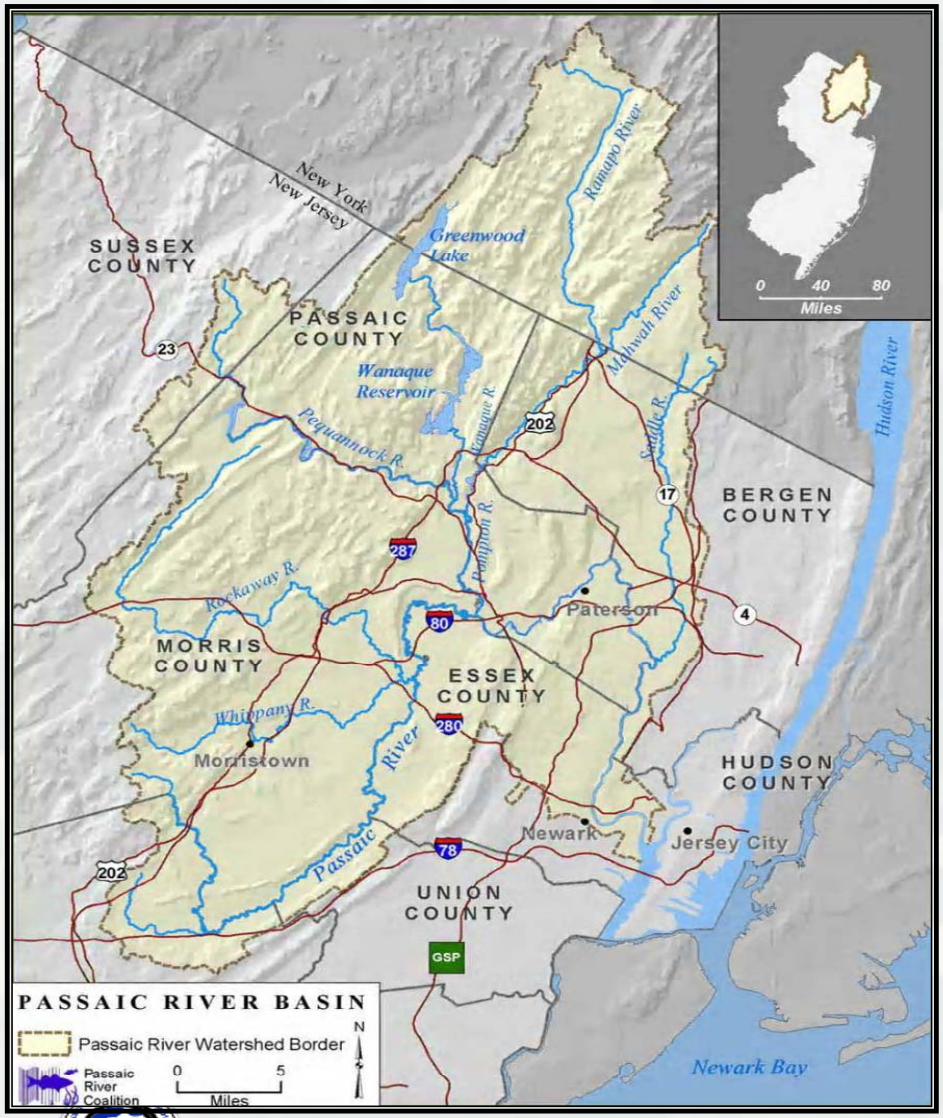
Purpose of Briefing

- Provide an overview of the work performed during the last year on the six alternatives that NJDEP & USACE agreed to reevaluate from the 1987 Feasibility Report
- Outline path forward
  - Public Meetings
  - Detailed Analysis (Phase 2)

Passaic River Study Request

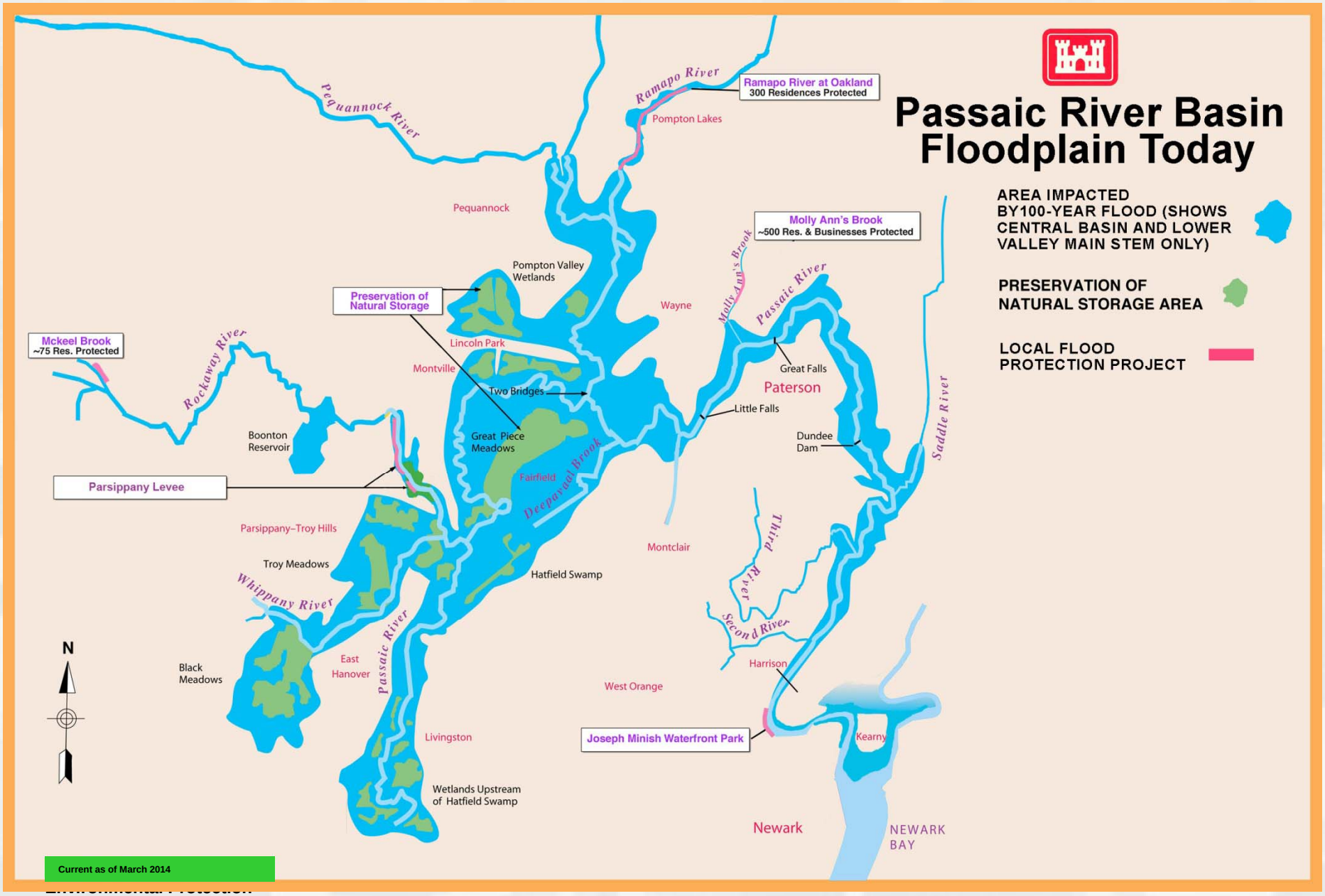
- April 2010 – Governor Chris Christie creates Passaic River Basin Flood Advisory Commission through Executive Order 23
- Feb 2011 – Commission officially recommends reevaluation of the Passaic River Basin for long-term flood risk management as 1 of 15 recommendations.
- 31 Mar 2011 – Letter from Gov Christie to Chief of Engineers that requests support of
  - Preservation of Natural Flood Storage Areas
  - Reevaluation of the Passaic River Main Stem Study
- June 2012 – NJDEP and USACE execute Feasibility Cost Sharing Agreement, initiating Phase 1
- September 2012 – NJDEP and USACE Public Meetings

Passaic River Basin Facts



- 935 square mile basin
- ~2.5 million people (2000 census)
- ~50,000 people are in floodplain
- 20,000 homes, businesses, & public buildings in 35 communities
- Main Stem & major tributaries 100 year floodplain covers 40,000 acres (~60 mi^2) of which half is fully developed
- One of the most densely developed floodplains on the eastern seaboard
- Extensive environmental degradation to river system coupled with significant repetitive flooding

Passaic River Basin – Floodplain Today



Phase 1 Objective (Preliminary Alternative Analysis)

Prepare a report that provides sufficient detail (maximizing existing data) to allow the NJDEP to make an appropriate decision on which of the six alternatives to advance into Phase 2.

The Six Alternatives Jointly Agreed for Phase 1

1. Alternative 14A – Levees Floodwall, and Non-structural
2. Alternative 16A - Levees, Floodwall, Channelization, and Non-Structural Plan
3. Dual Inlet Newark Bay Outlet Tunnel Alternative, with Levees, Channelization
4. Beatties Dam & Two Bridges
5. 10-year Non-Structural
6. No Action

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Levee & Non-Structural Plan
Alternative 14A

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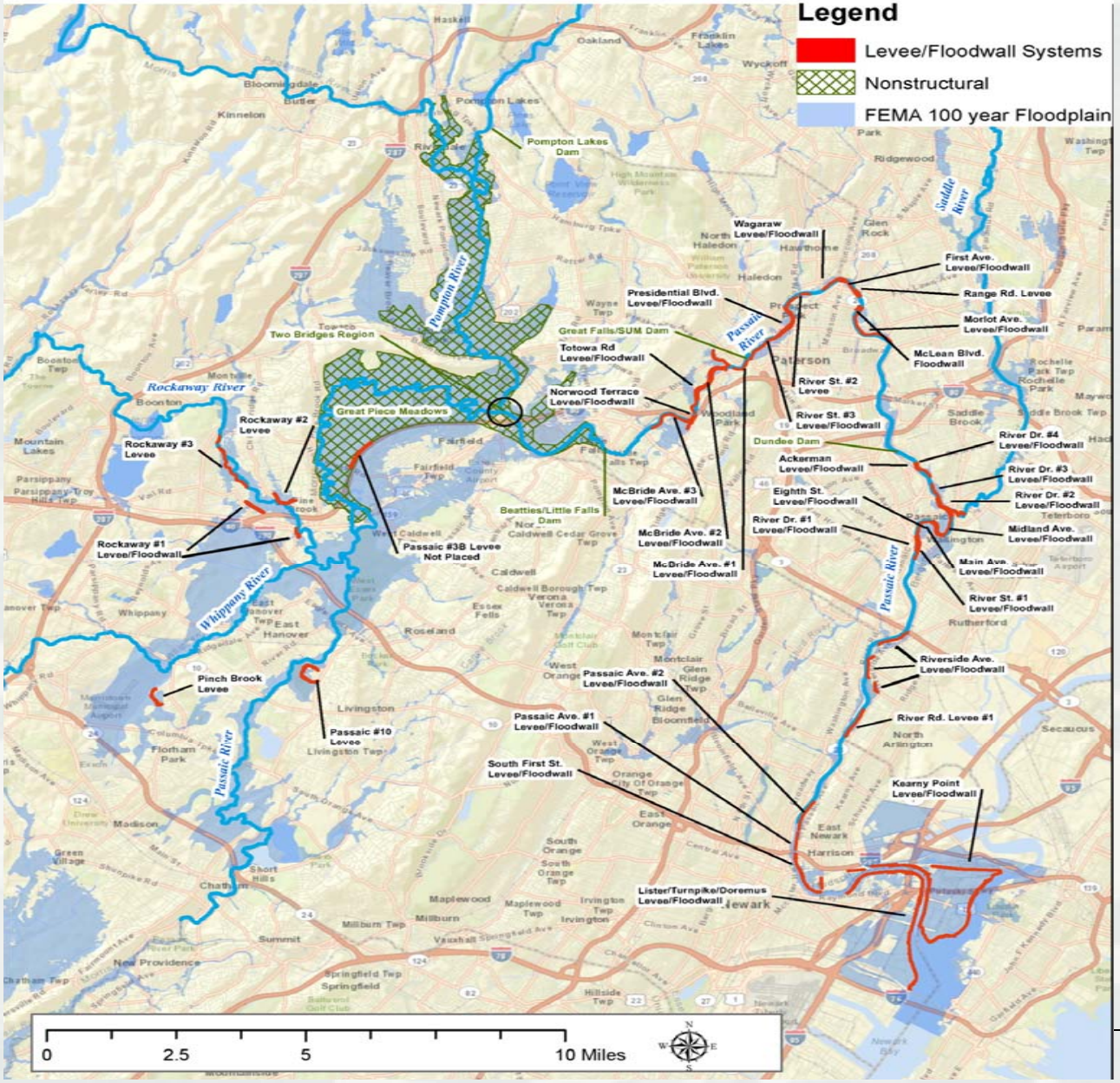

- 4,262 non-structural
- 0 miles of channel improvements
- 24 miles of levees
- 17 miles of flood walls
- 33 ponding areas
- 46 pump stations

- 1% exceedance lower and upper basin
- 10% exceedance highland & central

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Levee, Non-Structural & Channel Plan
Alternative 16A

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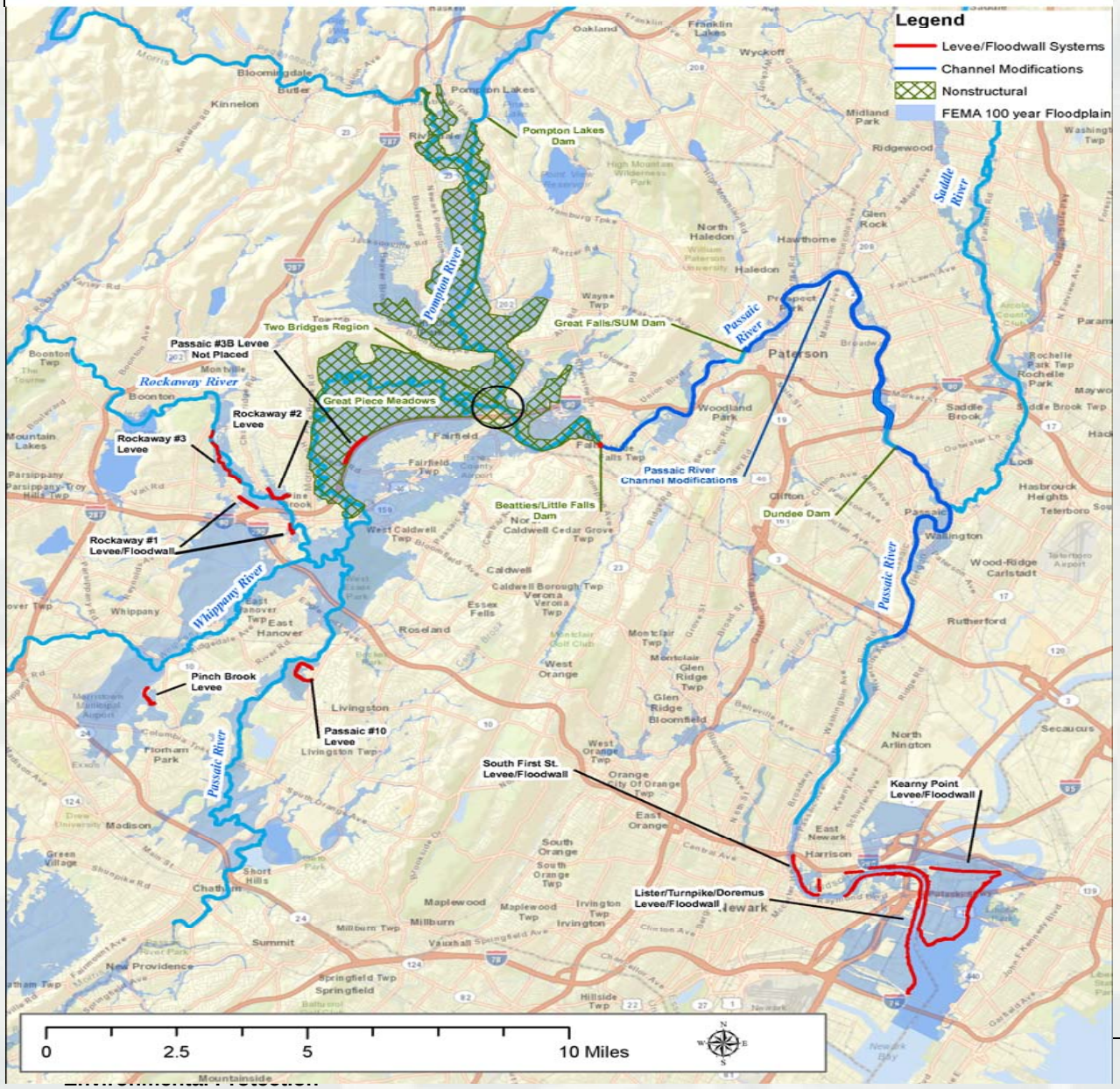

- 4,262 non-structural
- 16.5 miles of channel improvements
- 20 miles of levees
- 9 miles of flood walls
- 31 ponding areas
- 22 pump stations

- 1% exceedance lower and upper basin
- 10% exceedance highland & central

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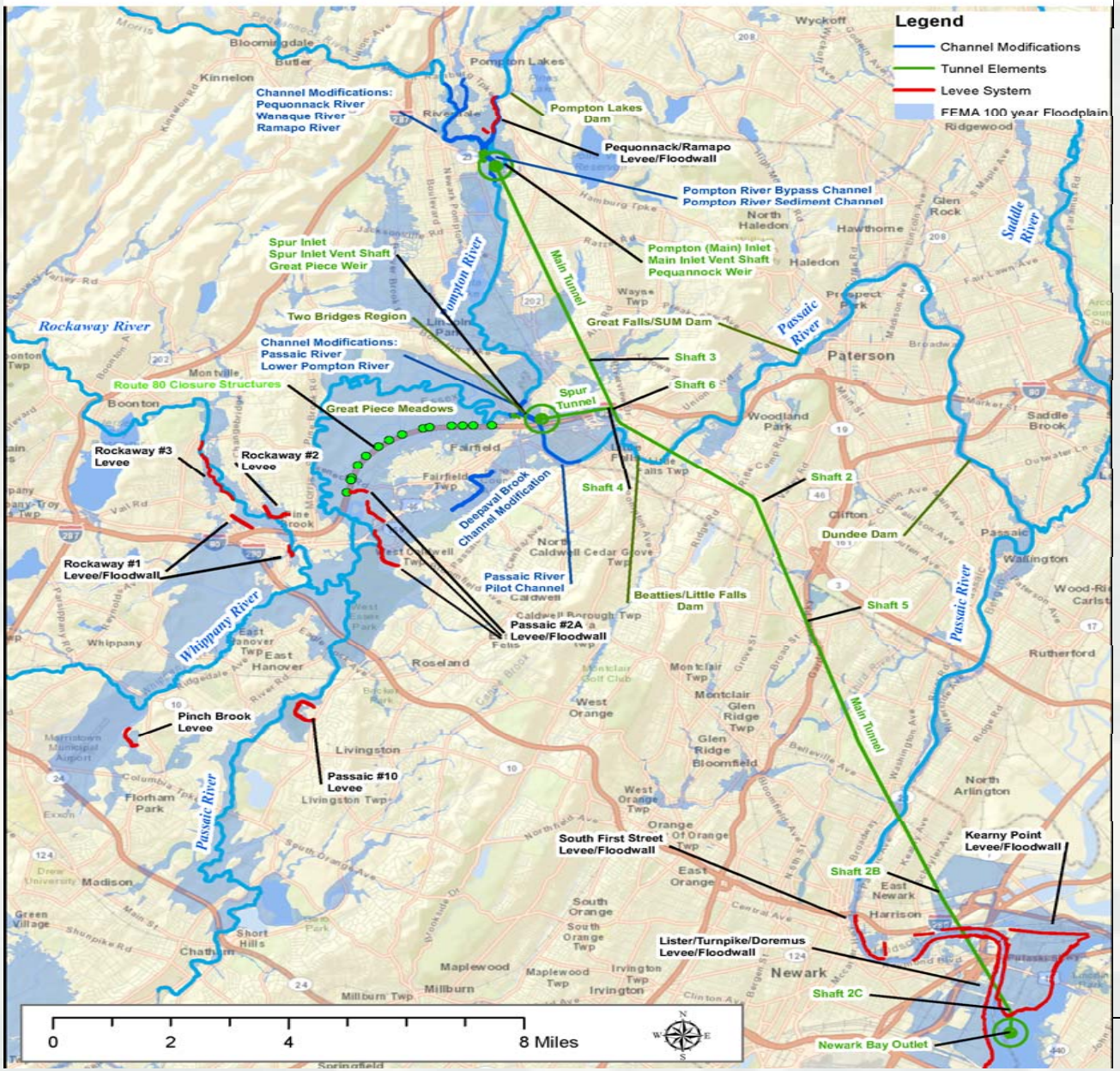
Dual Inlet-Newark Outlet Tunnel Alternative

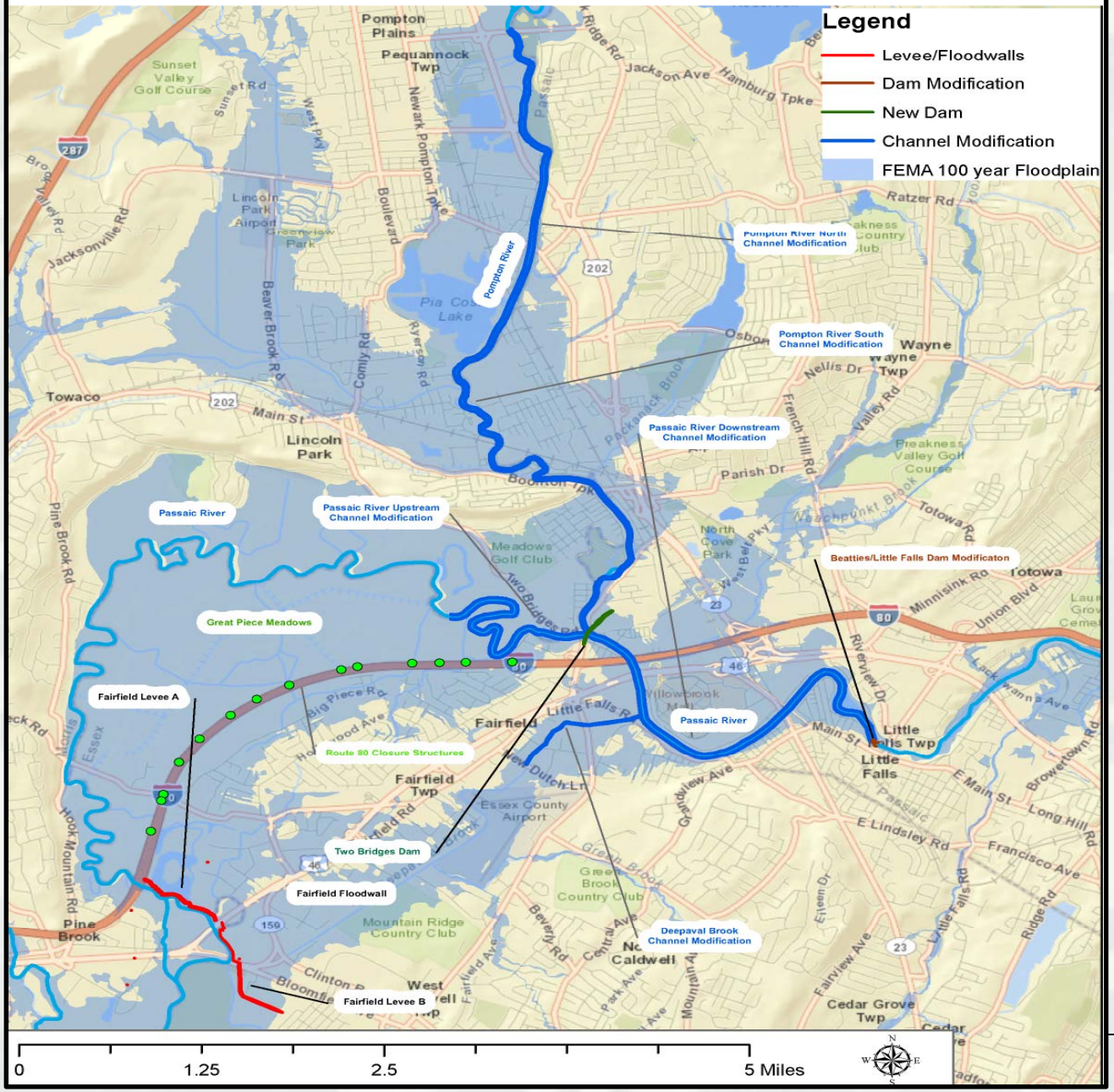


- 20 mile, 42 ft. dia. main diversion tunnel
- 1.2 mile, 23 ft. dia. spur tunnel
- 7 miles of channel improvements
- 7 miles of levees
- 13 miles of flood walls
- 17 ponding areas
- 15 pump stations

- 1% exceedance throughout

Flood Risk Management Project

Two Bridges/Beatties Dam Alternative



- 13.1 miles of Channel Improvements
- 1.2 miles of Levees
- 0.4 miles of Floodwall
- New 25 foot high Two Bridges Dam
- Rebuild Beatties Dam to 580 feet long with the same crest elevation

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Non-Strucutral Alternative

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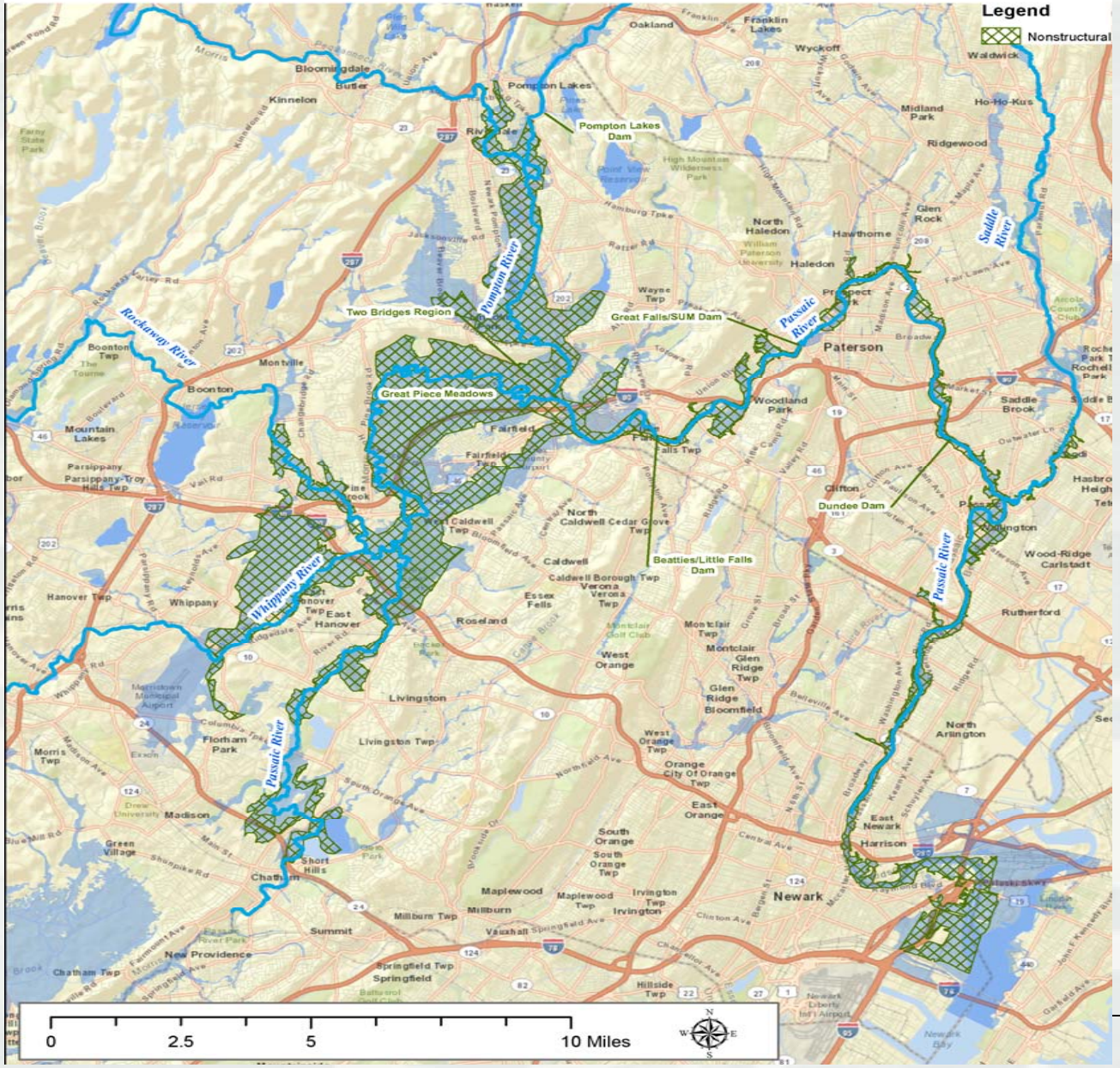

Plan includes:

•Floodproof	8,740
•Raise	646
•Ringwall	494
•Buyout	68
Non-structural total	9,947

• 10% exceedance throughout

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Preliminary Screening Results

Alternative	Total Cost 1987	Total Cost 2013[1]	Benefit-Cost Ratio 1987	Benefit-Cost Ratio 2013	O&M Costs (Total)	Estimated Contamination Costs[4]
14A	*$876M*	*$3.1B*	*1.06*	*0.8 – 1.2*	*$11M*	*Moderate*
16A	*$1B*	*$5.8B ($3.2B)[5]*	*1.1*	*0.5 – 0.7 (0.8)*	*$21M*	*Significant 8.83MCYs*
Newark Bay Outlet Tunnel	*$2.1B*	*$4.7B*	*1.1*	*1.02 – 1.44*	*$16M [3]*	*Low*
Beattie's Dam / Two Bridges	*Not in 1987 GDM*	*$1.9B*	*Not in 1987 GDM*	*0.6 – 0.80*	*$6M*	*Low*
Nonstructural (10-year LOP)	*$1.3B*	*$1.2B*	*0.8*	*1.3-1.9[2]*	*$0*	*Low*

1. Costs for Alternative 16A and Beatties Dam /Two Bridges Alternative assume that excavated material dredged during channelization will be disposed (tipping fee) and not re-used for levee construction. Any contamination disposal would be funded by NJDEP
2. The 10yr non-structural plan benefits were evaluated as if it were a levee at the 10 year stage. Because flood-proofing is proposed for the vast majority of the buildings the overall damage reduction may be somewhat high. Further, there is no building specific data to use for this model (only 11 reaches (out of 216) were modeled). Non-structural damage reduction varied between 2% to 42% of the without project damage. This suggests that there *is tremendous uncertainty* in the estimated benefits.
3. USACE shall perform all measures to ensure integrity of the tunnel, i.e. O&M. Cost provided does not break Fed/Non-Fed share
4. Assumes all excavated material is contaminated and must be disposed, accordingly.
5. Assumes all excavated material may be re-used and not contaminated.

Issues Common to All Alternatives

- Floods are more frequent and intense, what used to be a 100 year (.01 probability of exceedance) flood is now a 60 year (.17 probability of exceedance)
  - ► Levees and flood walls need to be higher
- Interior Drainage (drainage inside levees) was not updated
- Levee foundations & potential for contamination not accounted
- Historic property and natural resources (wetlands, etc.) impacts not evaluated

Change in Flood Depths when compared to 1995 Report Values at Little Falls

Return Period	Difference in feet
10 year	+ 1.6
100 year	+ 1.3
500 year	+ 1.1
Levees and floodwalls would have to increase 1 to 1.5 feet to contain the latest estimated 100 year event.	

Conclusions

- All alternatives have uncertainty.
- Predicted Flows (& Water Surface Elevations) have risen a moderate amount. (100 yr. is now about a 60 yr. design)
- Hurricane Katrina related design requirements increased costs.
- Construction costs have risen considerably.
- Damages have risen only a moderate amount.
- The buyout analysis indicates that the current number of buy-outs has a negligible effect on the benefit-to-cost ratio.
- B/C ratios have not significantly increased or decreased from previous reports.
- No action plan results in excess of $251 million in average annual equivalent flood damages

NJDEP Selected Alternatives for Phase 2 – Detailed Analysis

- 14A – Levees, Floodwalls, and Non-Structural Plan
- Dual-Inlet – Newark Bay Outlet Tunnel
- 10-year Non-Structural
- No Action

Goals of Phase 2

- Perform necessary studies and data gathering to bring all three alternatives to an equal level for comparison
- Analyze the environmental impacts of the selected plan (NEPA)
- Select one plan for recommendation to Congress for construction
- Develop cost estimate and schedule to construct the recommended plan

Path Forward

- USACE with NJDEP will hold three public information sessions –
  - Fairfield – March 25th
  - Pompton Lakes – March 27th
  - Lyndhurst – April 3rd
- Proceed with Detailed Phase 2 with selected alternatives, subject to receiving future funding

Proposed Schedule

Milestone	Schedule
Cost-Sharing Funding Agreement Execution & Waiver	Jun 2014
NEPA Scoping Meeting	Sep 2014
Tentative Selected Plan Milestone	Oct 2017
Agency Decision Milestone	Jan 2019
Final Report	Mar 2019
Chief's Report	Nov 2019

Assumptions
1. All public meetings will be completed in March/April 2014
2. Schedule is subject to the availability of funds and internal schedule approvals.

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