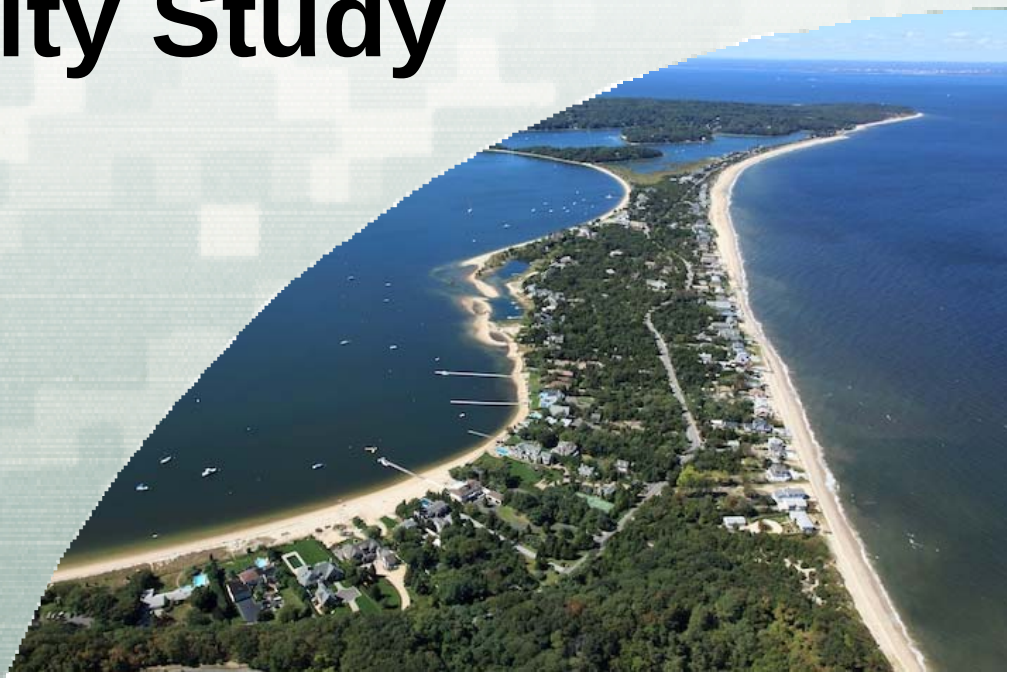
North Shore of Long Island, Asharoken, New York Feasibility Study

Asharoken, NY Public Meeting

June 30, 2015



New York District

Non-Federal Sponsor

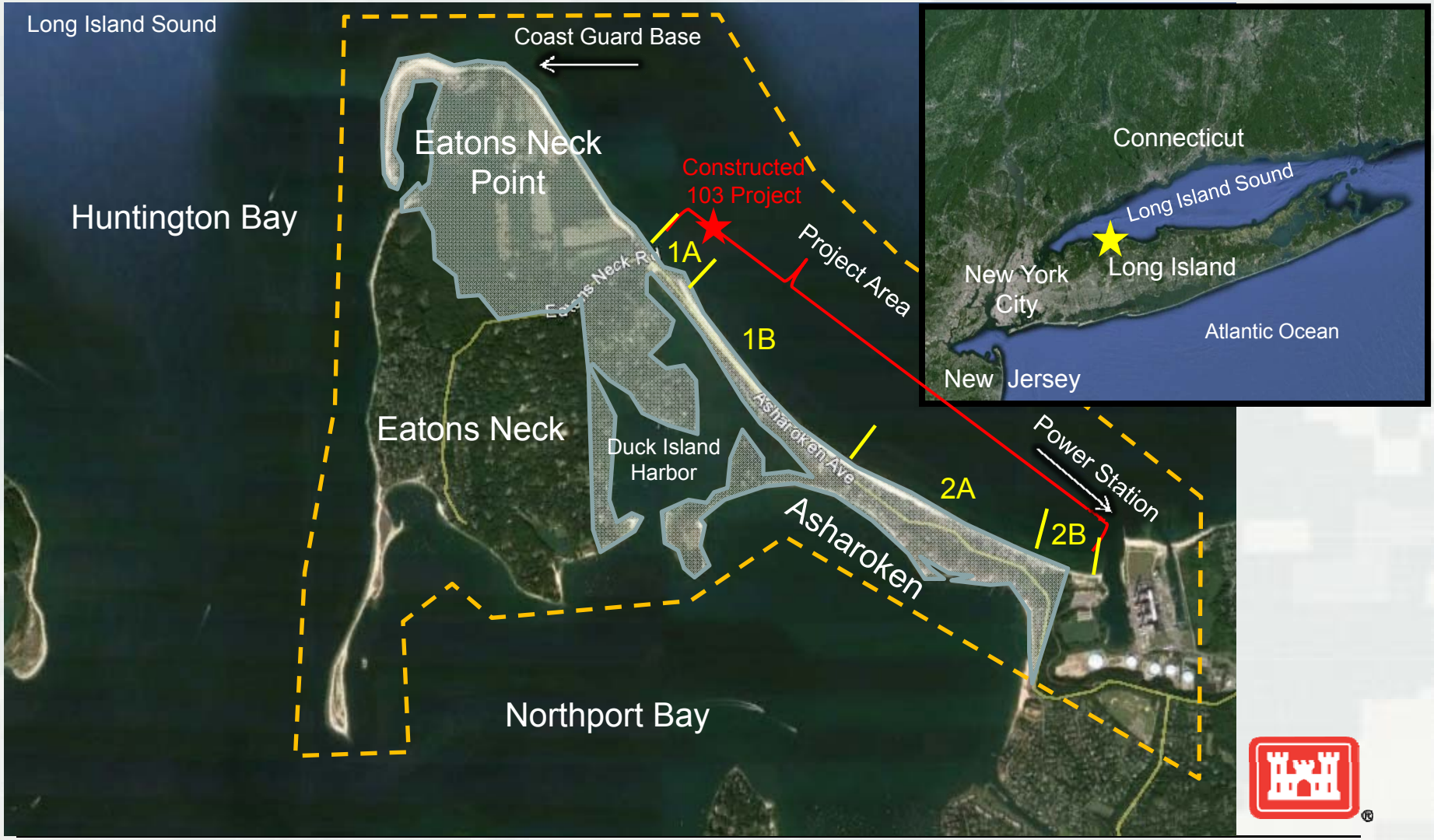
- New York State Department of Environmental Conservation (**NYSDEC**)
- **Local Sponsor:** Incorporated Village of Asharoken

Disaster Relief Appropriations Act 2013

- PL113-2 authorized and appropriated funds to complete this study at *100% Federal expense*
  - ► Initial Construction: 65% Federal and 35% non-Federal
  - ► Renourishment Costs: 50% Federal 50% non-Federal

Study/Project Area

- **Project Area:** The shoreline immediately west of the power plant northwest for approximately 2.4 miles to Eatons Neck Rd.



BUILDING STRONG®

Critical Areas and Infrastructure

- Evac. Route
- US Coast Guard, Military Base
- Light House
- Fire Department
- Power Station
- 2000+ Population
  - Asharoken - 654
  - Eatons Neck - 1,406
- Isthmus width
  - 180ft – 1000ft

USACE Coastal Basics

- "Corps Projects" are really joint "Corps, State, Municipal Projects"; Projects are planned and implemented with Local Sponsors. Each partner must support the plan & has a role.
- For Federal participation, must show benefits exceed costs.
- Benefits must contribute to National Economy (National Economic Development / NED Benefits)
- Select plan which maximizes benefits relative to costs.
- For Federal funds to be spent, the beaches must have Public Access that is open to all on equal terms

Problems & Opportunities

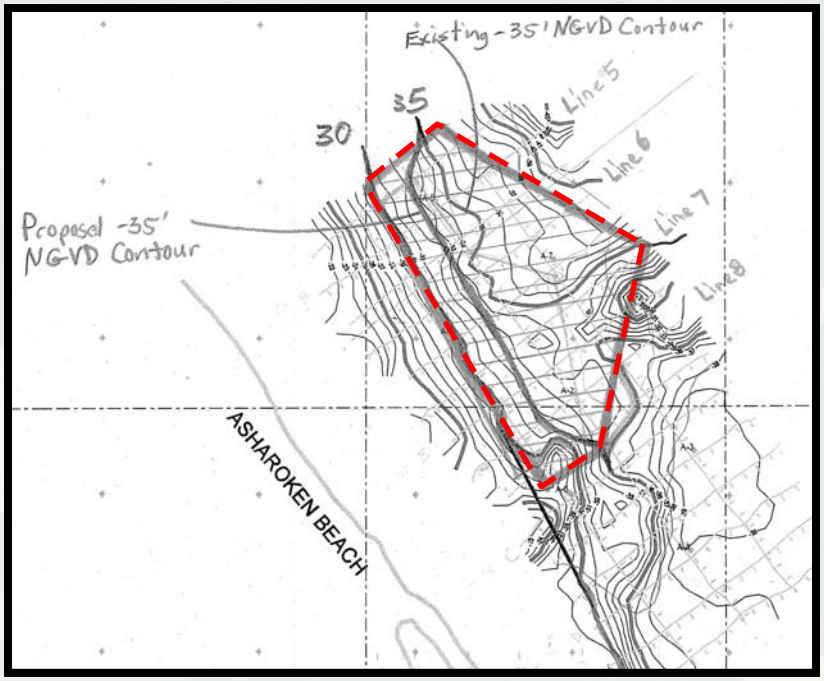
- The Village of Asharoken experiences moderate to severe beach erosion and flooding on the areas fronting Long Island Sound, Northport Bay, and Duck Island Harbor.

- **Problems** in the study area are:
  - Damage to structures (including buildings, and existing coastal structures) caused by storm-induced wave attack, erosion, and flooding due to storms and high tides.
  - Disruption to Asharoken Avenue, the only route to and from the Village of Asharoken and Eatons Neck.

- **Opportunities** identified within study area:
  - Reduce the threat of damages to existing residential buildings, and existing coastal protection measures caused by storm-induced wave attack, erosion, and flooding from storms and high tides.
  - Reduce disruption and damage to Asharoken Avenue.

Borrow Area A, Dredging Plan

- Borrow area usage in Long Island Sound will balance sand needs, and environmental impacts associated with dredging.
- The offshore sand borrow source will be used only for initial beach fill as previously coordinated with NYSDEC Region 1.

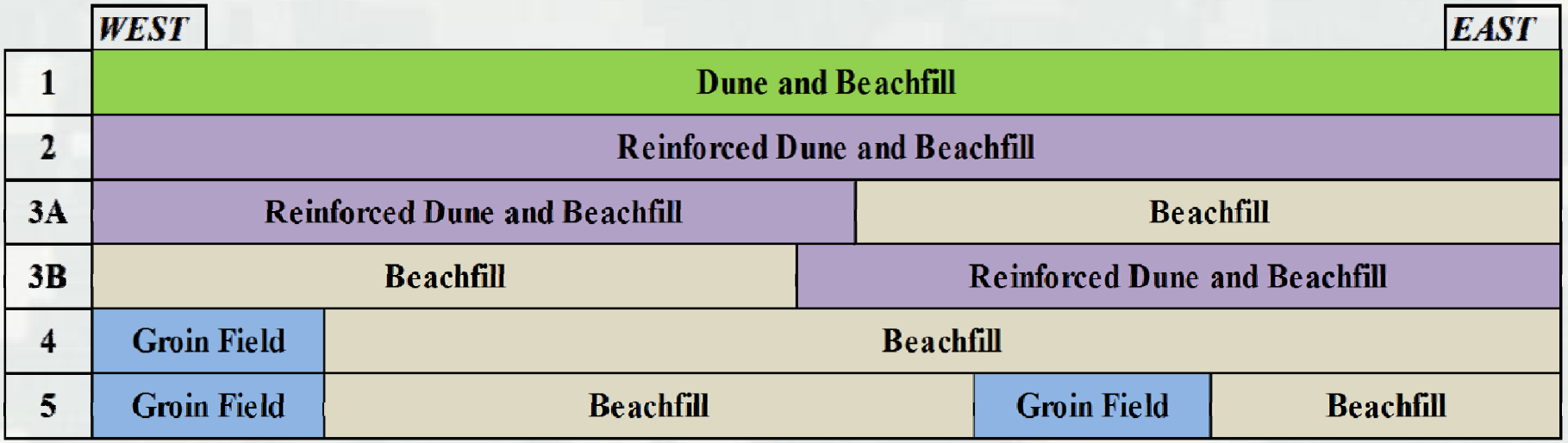


Measure Considerations

Measure	Carried Forward	Eliminated	Reason for Consideration/Elimination
Buy-Outs		X	Not Cost effective (100 houses, 50M)
Zoning		X	Not effective for existing structures
Floodproofing		X	Not effective for most structures facing L.I. Sound which are subject to erosion and wave attack.
Relocation		X	Not Cost Effective
Floodwalls and Levees		X	Not effective against erosion and wave attack
Beach Nourishment	X		Cost Effective (12,400 ft length; 22M)
Reinforced Dune with Beach Nourishment	X		Cost Effective (12,400 ft length; 43M)
Bulkhead or Bulkhead with Raised Dune		X	Not recommended because of frequent maintenance
Groins with Beach Fill		X	Not Cost Effective (24 groins; 45M)
Localized Groins with Beach Nourishment	X		Cost Effective
Offshore Breakwater with Beach Fill		X	Not Cost Effective (10 breakwater segments; 50M)
Sand Bypassing		X	Not effective to reduce storm damage risk. Limited updrift supply of material available. Cost also reflects trucking of 15,000 cy/yr from upland sources.
Installation of a Diffusion Pipe		X	Not effective as jetties and intake channel form an effective littoral blockage
Modification of the Jetties		X	Not effective as a storm damage reduction measures. Would adversely impact power plant operations.
Dredging the Updrift Fillet Areas		X	Not Cost Effective
Build a Causeway		X	Not Cost Effective
Road Raising		X	Would not protect residences. Eventual loss of beach.

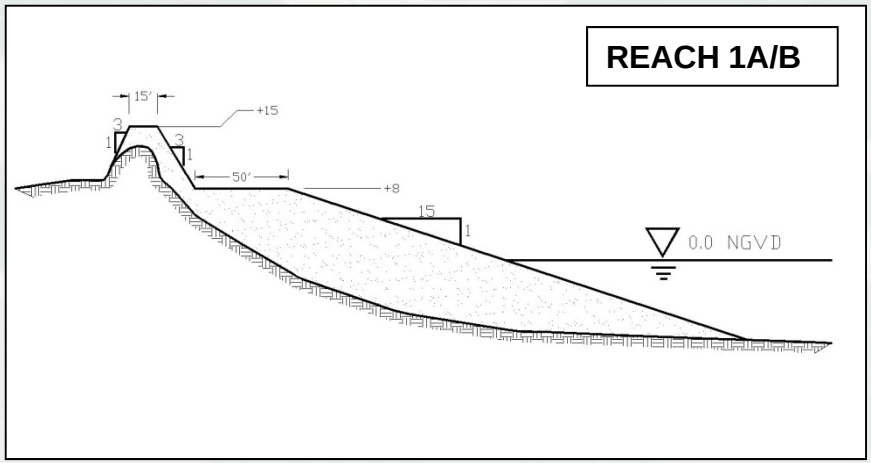
Alternatives Formulation

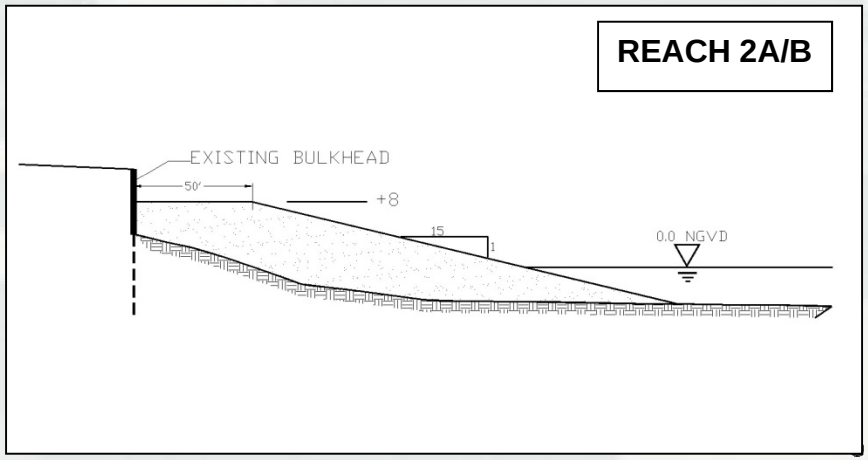
	Alternative 1 Beachfill Only	Alternative 2 Beachfill and Buried Seawall-full shoreline	Alternative 3 Beachfill and Buried Seawall-half shoreline	Alternative 4 Beachfill and Three West Groins	Alternative 5 Beachfill and 3 West, 8 East Groins
Initial Fill Volume (CY)	600,000	375,000	450,000	600,000	600,000
Coastal Structures	n/a	buried seawall	partial buried seawall	3 rock groins	11 rock groins
Nourisment (cy/period)	60,000 cy/3 yrs	200,000 cy/10 yrs	200,000 cy/10 yrs	80,000 cy/5 yrs	100,000 cy/10 yrs
Total Nourishment in 50yrs	1,000,000 cy	1,000,000 cy	1,000,000 cy	800,000 cy	500,000 cy



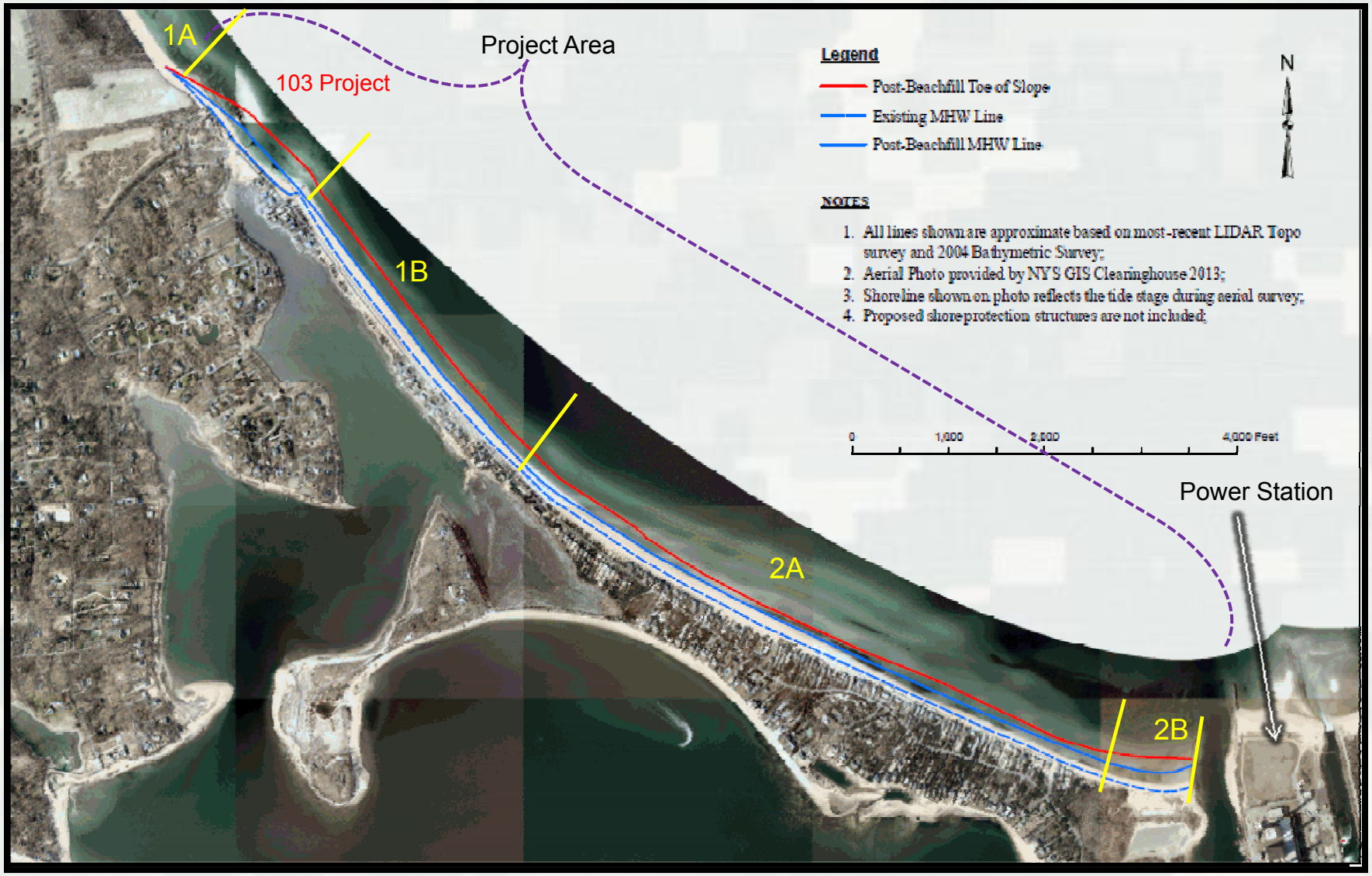
Alternative 1 – Beach Fill Only Plan

- 12,400 linear feet of beach berm and dune fill, from intersection of Bevin Road and Asharoken Avenue south, east to the west jetty of the power facility's inlet basin.
- Dune height at elevation +15 ft NAVD with a 15 ft dune crest width, landward and seaward dune slopes of 1V:3H
- 50 ft berm width at elevation +8 ft NAVD and a foreshore slope of 1V:15H to the existing bottom.



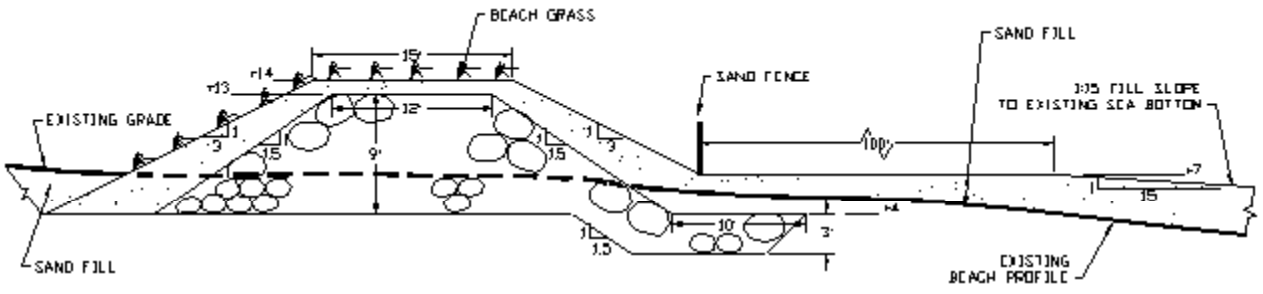


Alternative 1 – Beach Fill Only Plan



Alternative 2 – Reinforced Dune (Buried Stone Seawall) with Beachfill Plan

- 12,400 linear feet of beach berm, reinforced dune and dune fill cover for the same project length as Alternative 1.
- The sand dune design template has a crest width of 15 ft at elevation +13 ft NAVD and both the seaward and landward slopes of 1V:3H that completely encapsulate a trapezoidal shaped stone seawall of crest width 10 ft at elevation +11.5 to +12 ft NAVD with 1V:1.5H side slopes.



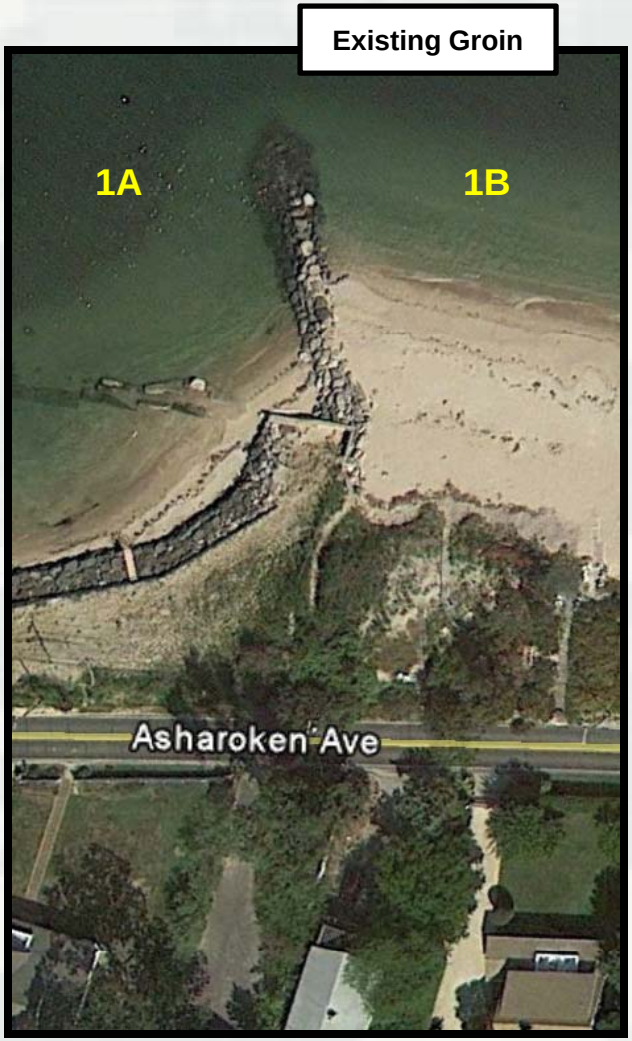
BURIED SEAWALL SECTION WITH BEACH FILL (NOT TO SCALE)

Alternative 3A/B – Combination Reinforced Dune and Beachfill

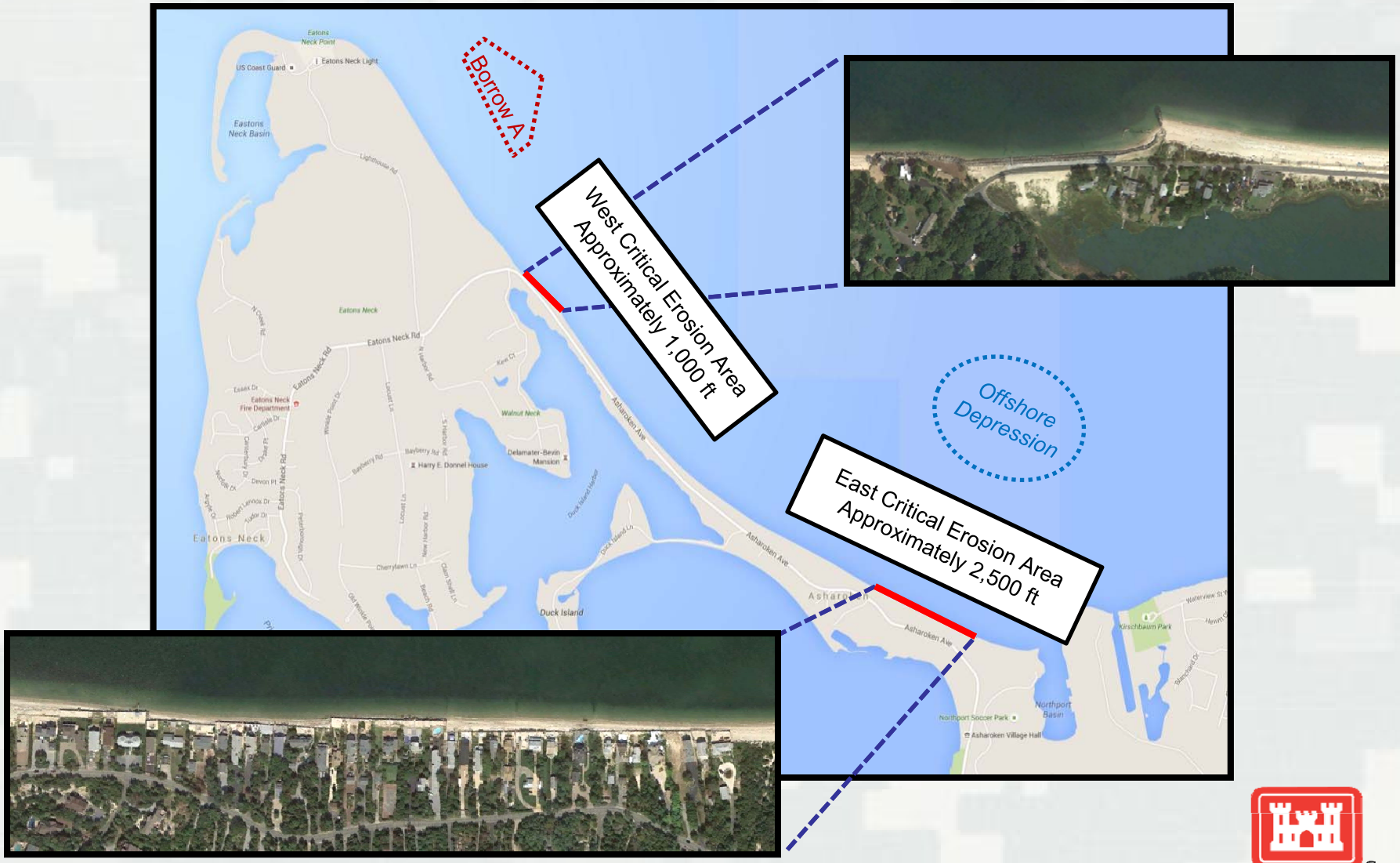
- 6,200 ft of beach and dune fill from Bevin's Rd. south (same as Alternative 1) and 6,200 ft of beach fill with reinforced dune (same as Alternative 2) from the southern border of non-reinforced dune to the west jetty of the power plant facility.
- Renourishment is the same for each 6,200 ft. reach as their associated alternatives.

Groin Consideration

- Potential to reduce localized erosion
- Reduced erosion results in reduced renourishment need (amount & frequency)
- Modeling undertaken to evaluate effectiveness of structures and refine designs
- Structures can be recommended by demonstrating that initial costs are offset by future sand needs

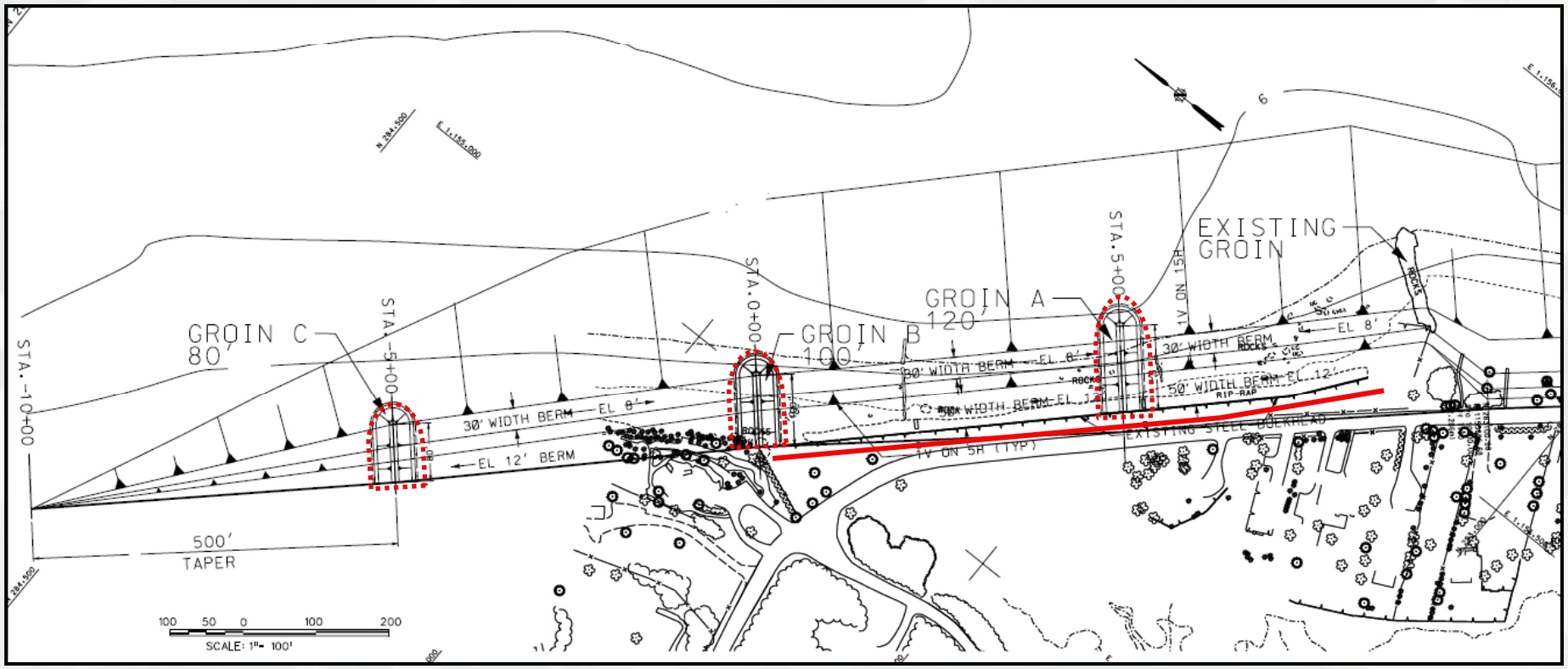


Groin Consideration



Alternative 4 – Beachfill with Localized Western Groin Plan

- This alternative provides groin field at the west critical erosion area to reduce renourishment frequency and quantity.



Alternative 5 – Beachfill with Localized West and East Groin Field Plan

- Groin field protection at both the west and east critical erosion areas to protect against storm damage and reduce renourishment frequency and quantity.

Alternative Comparison

	Alternative 1 *Beachfill Only*	**Alternative 4** Beachfill and *Three West Groins*	**Alternative 5** Beachfill and *3 West, 8 East Groins*
Initial Fill Volume (CY) Coastal Structures Nourisment (cy/period) Total Nourishment in 50yrs	600,000 n/a 60,000 cy/3 yrs 1,000,000 cy	600,000 3 rock groins 80,000 cy/5 yrs 800,000 cy	600,000 11 rock groins 100,000 cy/10 yrs 500,000 cy
Advantages	- Low Initial Cost	- Reduced Erosion Rate - Reduced Nourishment Volume and Frequency - Stabilized West Shoreline - Reduced Seawall Damage	- Reduced Erosion Rate - Reduced Nourishment Volume and Frequency - Stabilized both East and West Shoreline - Reduced both Seawall and Timber Bulkhead Damage
Disadvantages	- Frequent Nourishment - Frequent Seawall and - Bulkhead Damage Repair	- Frequent Bulkhead Repair	

Costs for Focused Array

	Alternative 1 Beachfill Only	Alternative 2 Beachfill and Buried Seawall-full shoreline	Alternative 3 Beachfill and Buried Seawall-half shoreline	Alternative 4 Beachfill and Three West Groins	Alternative 5 Beachfill and 3 West, 8 East Groins
Initial Fill Volume (CY)	600,000	375,000	450,000	600,000	600,000
Coastal Structures	n/a	buried seawall	partial buried seawall	3 rock groins	11 rock groins
Nourisment (cy/period)	60,000 cy/3 yrs	200,000 cy/10 yrs	200,000 cy/10 yrs	80,000 cy/5 yrs	100,000 cy/10 yrs
Total Nourishment in 50yrs	1,000,000 cy	1,000,000 cy	1,000,000 cy	800,000 cy	500,000 cy
COSTS					
Initial Construction Cost	*$25,660,000*	*$54,639,000*	*$39,786,000*	*$27,100,000*	*$32,200,000*
Annualized Initial Constr.	$1,077,000	$2,293,000	$1,670,000	$1,137,000	$1,351,000
Annual Nourishment Cost	$736,000	$648,000	$648,000	$567,000	$324,000
Annualized Monitoring Cost	$49,000	$49,000	$49,000	$50,000	$87,000
Total Annual Cost	$1,862,000	$2,990,000	$2,367,000	$1,754,000	$1,762,000
Annual Damage Benefits	$2,570,900	$2,570,900	$2,570,900	$2,570,900	$2,570,900
Net Benefit:	***$708,900***	***-$419,100***	***$203,900***	***$816,900***	***$808,900***
Benefit/Cost Ratio:	1.38	0.86	1.09	1.47	1.46

Alternative 4 – Beachfill with Localized Western Groin Plan

- Reduced Erosion Rate
- Lower Initial construction cost
- Less Frequency and Volume of renourishment
- Less frequency of storm damage at west seawall

Alternative 4	
	Beachfill and Three West Groins
Initial Fill Volume (CY)	600,000
Coastal Structures	3 rock groins
Nourisment (cy/period)	80,000 cy/5 yrs
Total Nourishment in 50yrs	800,000 cy
COSTS	
Initial Construction Cost	*$27,100,000*
Annualized Initial Constr.	$1,137,000
Annual Nourishment Cost	$567,000
Annualized Monitoring Cost	$50,000
Total Annual Cost	$1,754,000
Annual Damage Benefits	$2,570,900
Net Benefit:	***$816,900***
Benefit/Cost Ratio:	1.47

Beachfill Berm Optimization

- Modeling confirmed that the total damage costs decrease as the berm widths increase throughout the project reaches.
- The 50 ft berm caused a significant reduction in damages compared to the 30 ft berm.
- The 50ft berm proved to be the optimal width when compared to the 70ft berm as the difference in total damages between these two scenarios resulted in a small decrease of damages.

With-project Average Annual Total Damages

Reach	W/O Project	30 ft Berm	50 ft Berm	70 ft Berm
1A	$596,100	$90,000	$64,300	$59,000
1B	$83,200	$46,200	$4,300	$4,300
2A	$2,083,900	$354,400	$123,700	$112,000
Total	**$2,763,200**	**$490,600**	**$192,300**	**$175,300**

Price Level February 2015, FDR 3.375%, Project Life 50 years

Real Estate Considerations

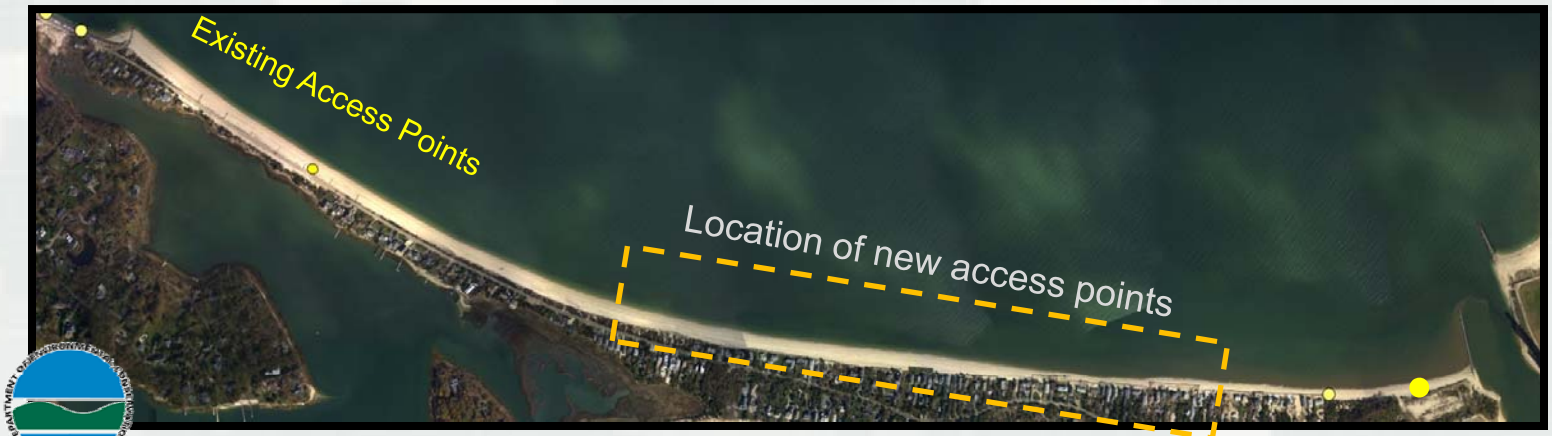
- Perpetual beach easements for all parcels where sand is placed (provide public access)
- Fee title for all public access ways to beach
  - ► Required minimum width: 6 feet
- Perpetual Beach Storm Damage Reduction Easements – 247 Parcels required

Sea Level Rise

- The project has been evaluated based upon the historic rate of RSLC 0.4 ft / 50 years.
- Response Strategy:
  - Analysis for 3 rates of RSLC are required
  - A Sensitivity, Risk and Uncertainty analyses will be conducted
  - The intermediate rate of +1.3 ft and high rate of +2.6 ft in through 2069 will be used.

Public Access

- Village of Asharoken / NYSDEC have prepared a draft Public Access Plan
- NY District has tentatively identified the plan meets Corps requirements
- Would like vertical team concurrence on access plan.
- Plan provides:
  - Access consistent with expected use of the area (low recreational use)
  - Access points each ½ mile that are open to all on equal terms.
  - Access points exist (yellow), the remainder are included as RE costs.
  - Plan includes parking consistent with expected use. Parking at east and west sites, intermediate sites are drop-off locations.



Schedule / Next Steps

North Shore of Long Island, New York Combined Erosion Control and Storm Damage Reduction Project	
Milestones	**Dates**
Tentatively Selected Plan Milestone (CW262)	**Aug 5, 2015**
Draft Report Submittal to HQ (CW150)	**Sep 2015**
NAD/HQ/Public Review (CW250)	**Sep 2015**
Agency Decision Milestone (CW263)	**Dec 2015**
Decision Report Submittal to MSC/HQ Milestone	Mar 2016
Civil Works Review Board	May 2016
Submit Chief's Report to ASA CW (CW270)	**Sep 2016**
Asharoken Construction	**Fall 2017**

Points of Contact

North Shore of Long Island, Asharoken, New York Feasibility Study

NYSDEC at (518) 402-8185

Sue McCormick, P.E., Chief Coastal Erosion Management
susan.mccormick@dec.ny.gov

Matt Chlebus, Project Engineer
matthew.chlebus@dec.ny.gov

USACE at (917) 790-8627

Ronald Pinzon, Project Manager
Ronald.R.Pinzon@usace.army.mil

New York District