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Wilmington District

Presentation  
to the Civil Works Review Board

# West Onslow Beach and New River Inlet (Topsail Beach), NC General Reevaluation Report

by  
Colonel J.P. Pulliam  
Commander, Wilmington District  
South Atlantic Division

17 April 2008





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# Purpose

To obtain Civil Works Review Board (CWRB) approval  
for final public review of the

*Topsail Beach Hurricane and Storm Damage Reduction  
Final General Reevaluation Report (GRR)  
and  
Environmental Impact Statement*



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# District Presentation Agenda

- Introductions
- Project Description
- Project Importance
- Project Evolution
- Plan Formulation
- Reviews
- Project Timeline



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# Project Description

**A flood and coastal storm damage  
reduction project for Topsail Beach,  
North Carolina:**

Dune and berm project

Approximately 5 miles long



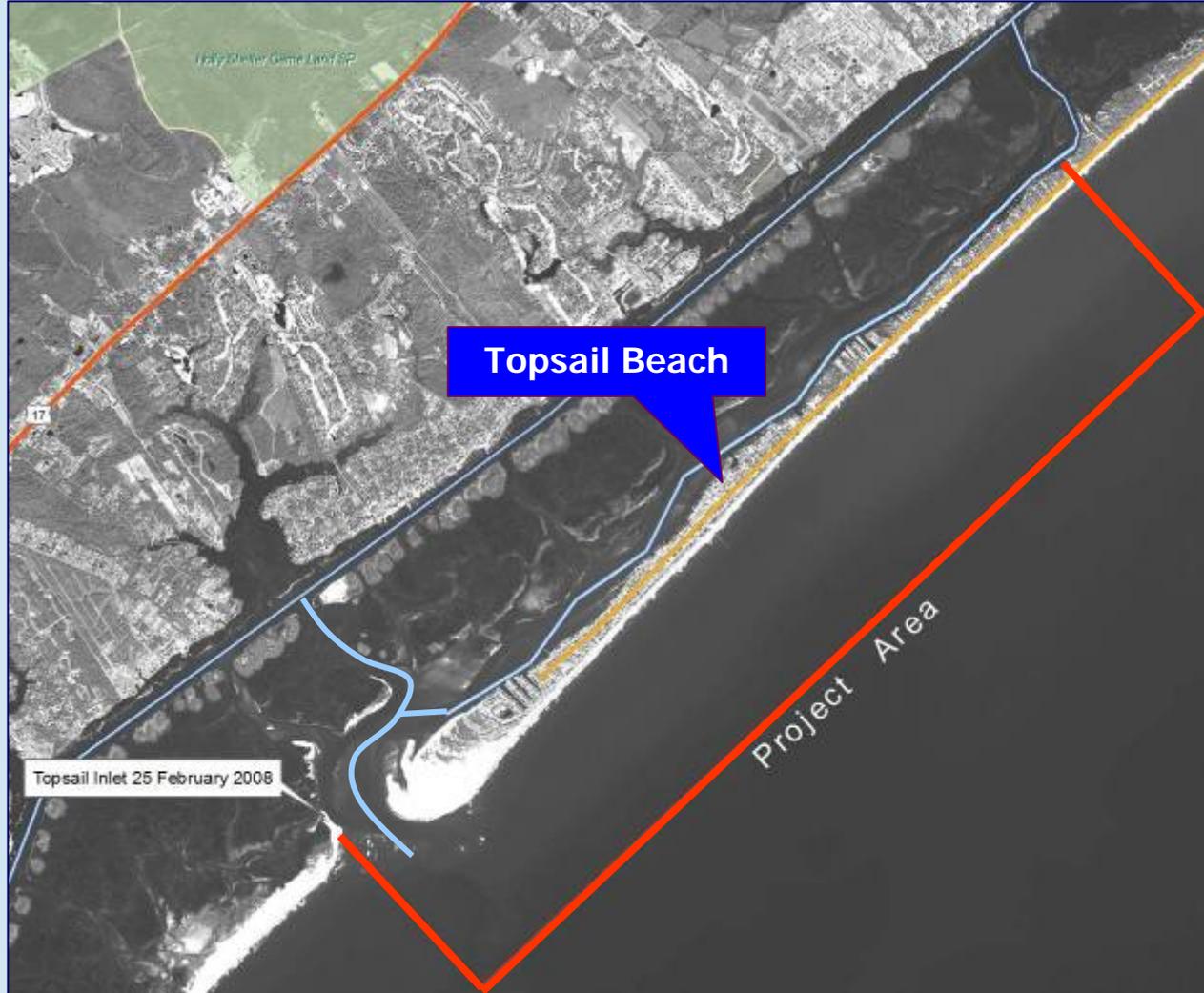
# Authorization

- **Section 101 of the 1992 Water Resources Development Act (WRDA)**
  - (15) WEST ONSLOW AND NEW RIVER INLET, NORTH CAROLINA. – The project for flood control, West Onslow and New River Inlet, North Carolina: Report of the Chief of Engineers, dated November 19, 1991, at a total cost of \$14,100,000, with an estimated Federal cost of \$7,600,000 and an estimated non-Federal cost of \$6,500,000.
  
- **FY 2001 Energy and Water Development Appropriations Act (PL 106-377) (referenced to House Report—HR 106-693)**
  - West Onslow Beach and New River Inlet, North Carolina – The Committee has provided \$330,000 for a *General Reevaluation Report* of the currently authorized project *and the remaining shoreline at Topsail Beach*. [emphasis added]



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# Location



West Onslow Beach and New River Inlet (Topsail Beach), NC  
New River Inlet (Topsail Beach), NC

Final GRR & EIS  
Final GRR & EIS



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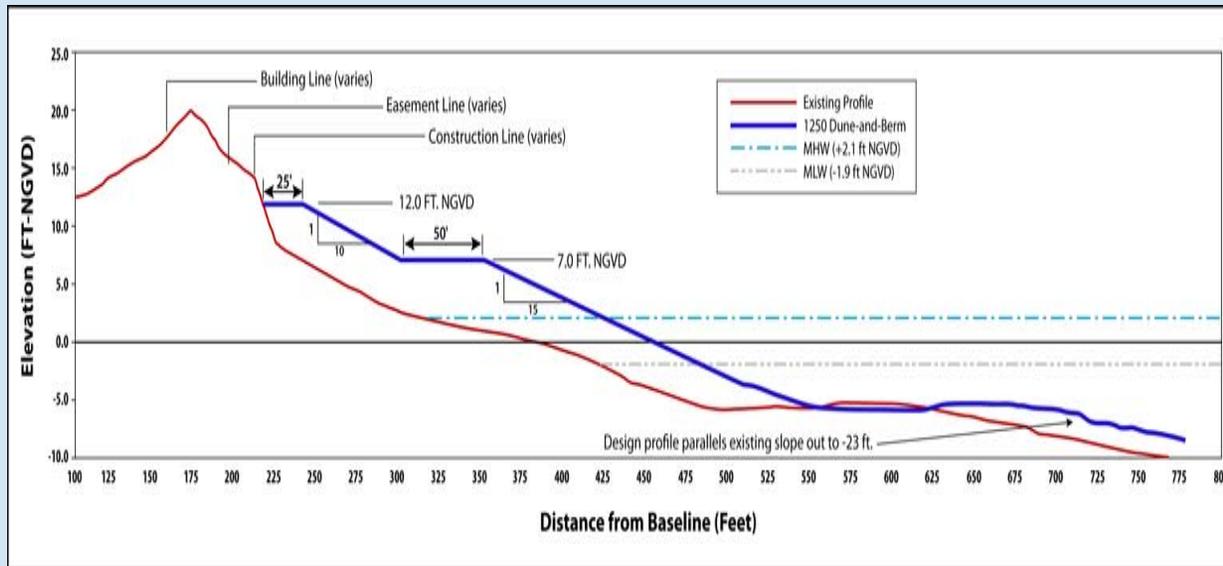
# Topsail Beach Typical Development



**Mostly single family residential**



# Project Metrics – Recommended Plan

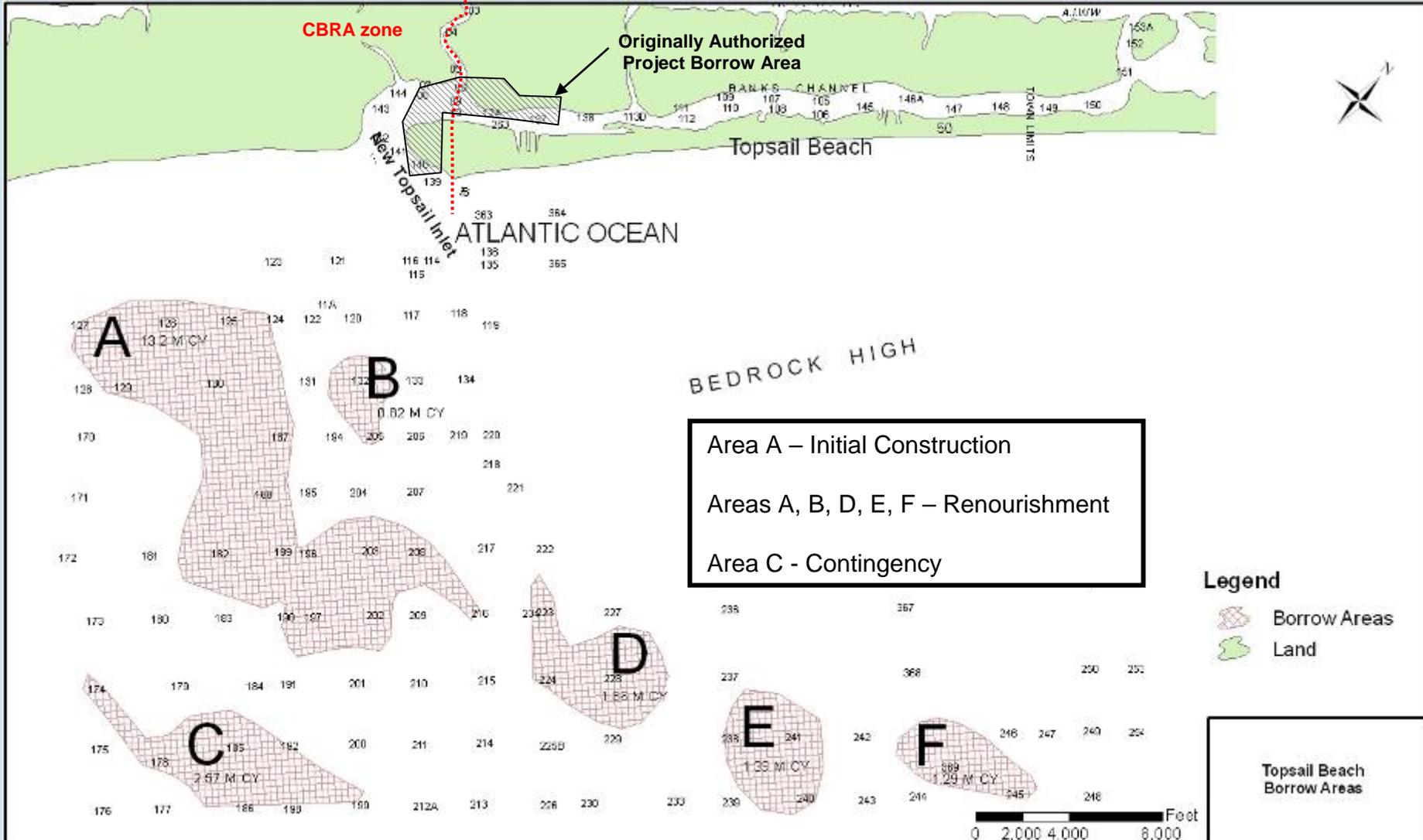


- 12' dune 25' wide + 7' berm 50' wide  
26,200' total length (incl. transitions)
- 3.2 M cu yds (initial construction)  
866K cu yds (renourishment ea 4 yrs)
- \$32.1 M initial construction cost
- \$9.2 M renourishment cost each 4 yrs
- \$13.6 M avg.annual benefits
- \$4.1 M avg. annual cost
- BCR = 3.3 to 1





# Borrow Areas



Area A – Initial Construction  
 Areas A, B, D, E, F – Renourishment  
 Area C - Contingency

**Legend**  
 Borrow Areas  
 Land

**Topsail Beach Borrow Areas**



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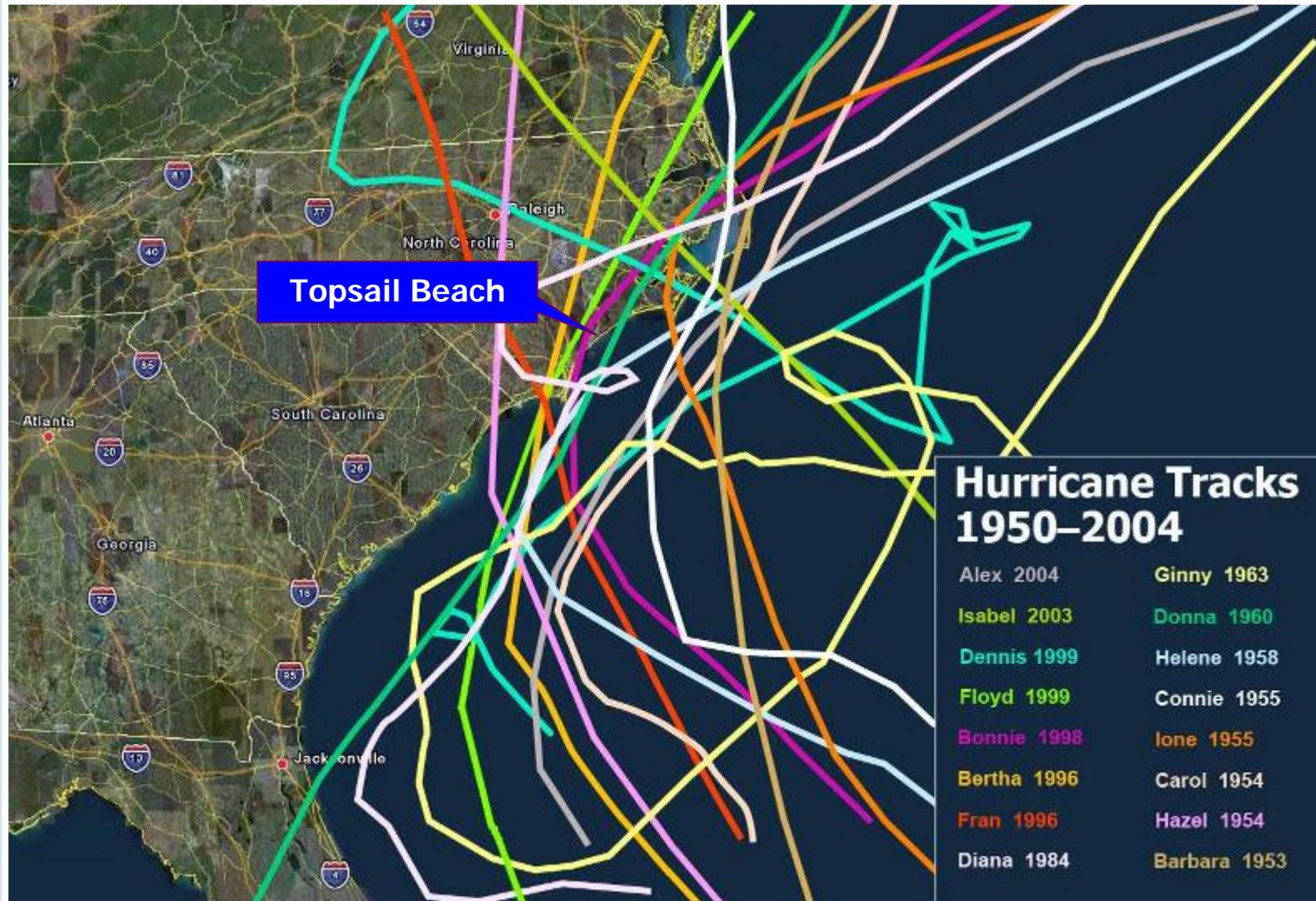
# Why is this project important?





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# Why this Project?



West Onslow Beach and New River Inlet (Topsail Beach), NC  
New River Inlet (Topsail Beach), NC

Final GRR & EIS West Onslow Beach and  
Final GRR & EIS



# Why this Project?



*Damage from Hurricane Fran*

**Average Annual Property Damage  
due to storms:**

**\$9,238,000**

**(avg. annual income of Topsail  
resident: \$35,838 in 2002)**



*Female loggerhead turtle*

## **Loss of Beach**

- **Narrower beach is less suitable habitat for endangered species, such as sea turtles & seabeach amaranth**
- **Less area on beach for recreation → quality of life & economic impacts**



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# How did the project evolve?

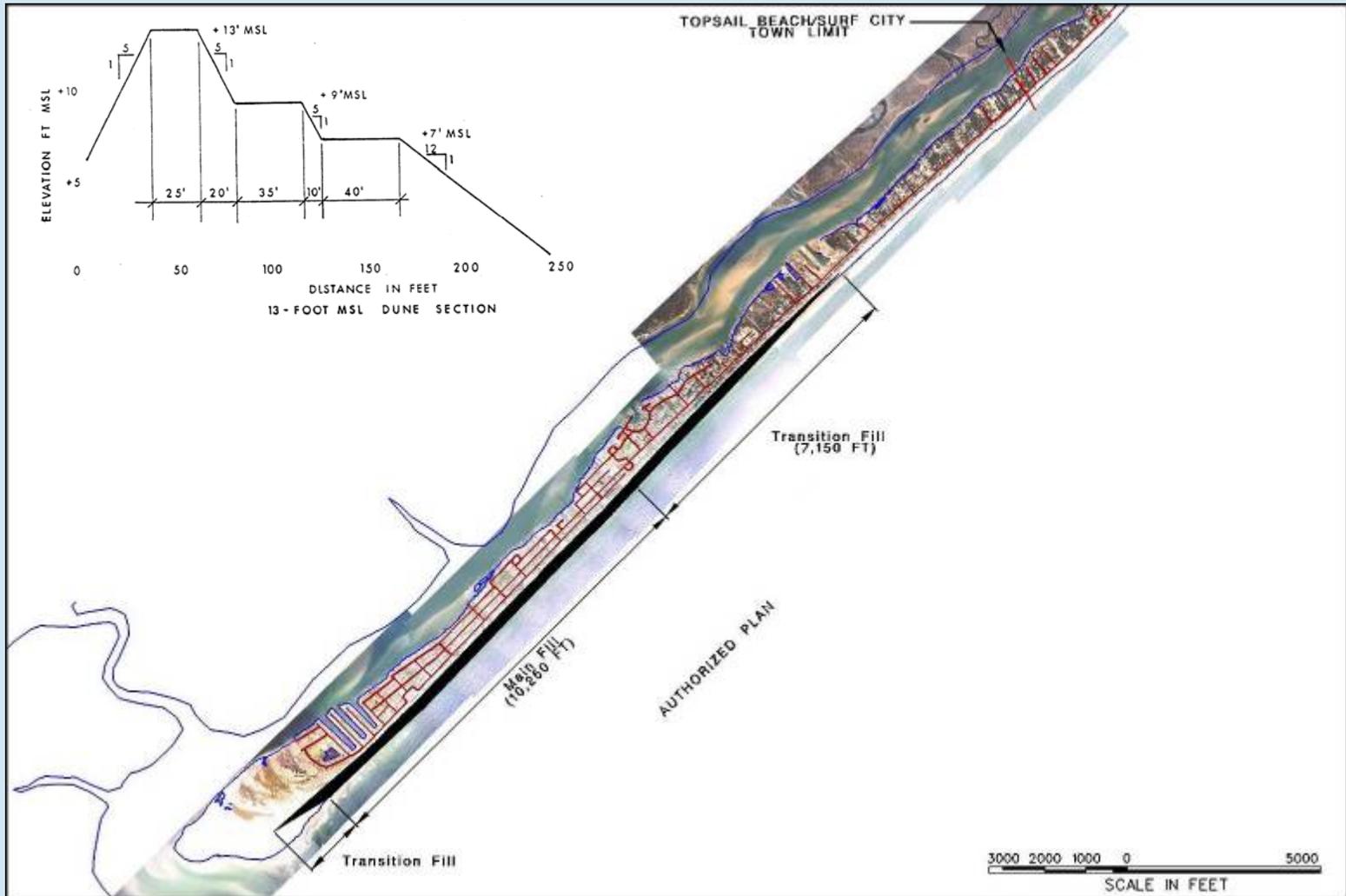


West Onslow Beach and New River Inlet (Topsail Beach), NC RRR & EIS Final GRR & EIS  
West Onslow Beach and New River Inlet (Topsail Beach), NC RRR & EIS Final GRR & EIS  
New River Inlet (Topsail Beach), NC Final GRR & EIS



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# Authorized Project (1992)

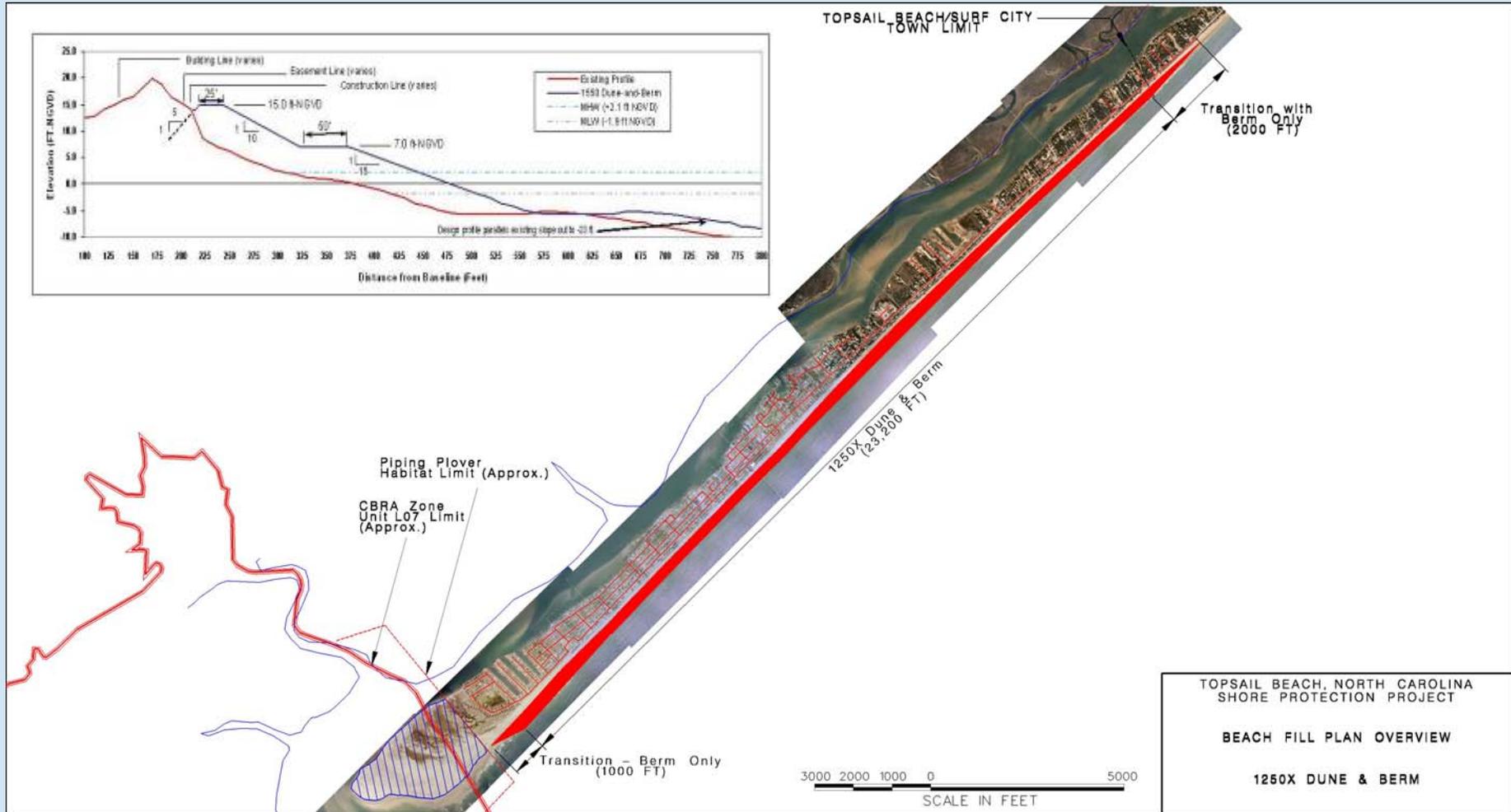


West Onslow Beach and New River Inlet (Topsail Beach), NC Final GRR & EIS  
New River Inlet (Topsail Beach), NC Final GRR & EIS



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# Recommended Project (2008)

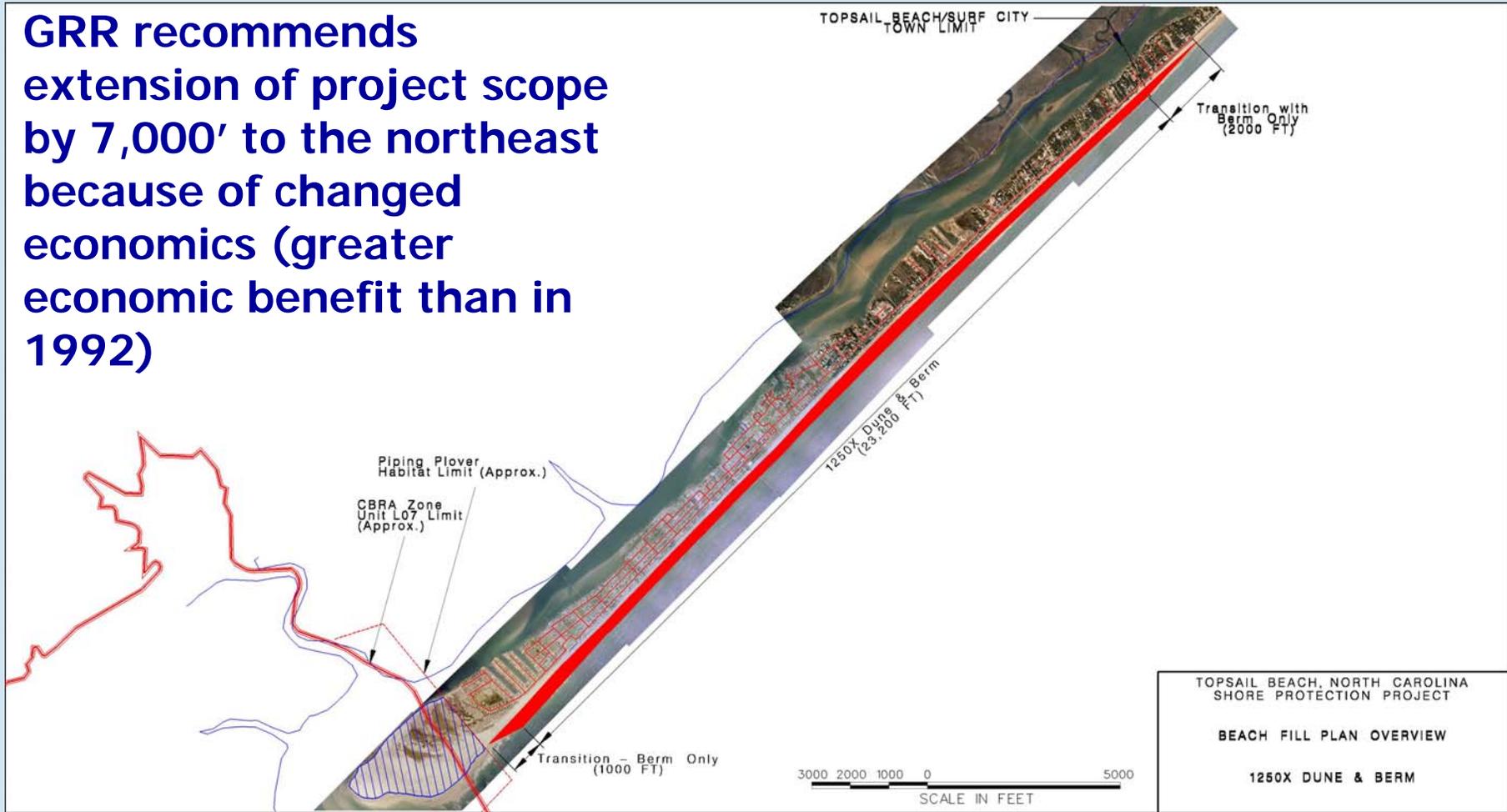




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# Why the difference?

**GRR recommends extension of project scope by 7,000' to the northeast because of changed economics (greater economic benefit than in 1992)**



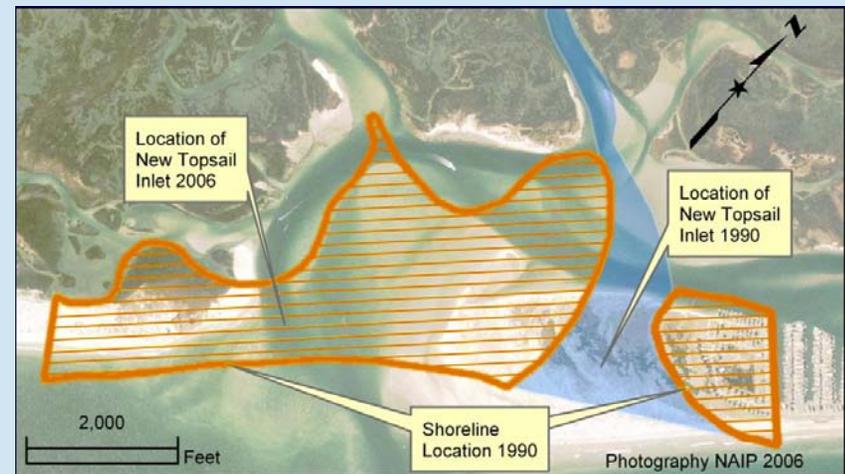


# Study Area: New Topsail Inlet, South End of Topsail Beach



Since the original study was completed and the project authorized in 1992, New Topsail Inlet continued to migrate to the southwest:

- Plan no longer requires terminal groin
- Borrow site options reduced (avoid CBRA Zone)





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# How? Plan Formulation





# Plan Formulation

## Initial Measures Considered and Screened

### Non-Structural

Institutional - Building codes, construction setbacks,  
floodplain regulations (existing condition)

Active - Retreat, within same parcel,  
no real estate cost

Relocation, to different parcel if available, acquire original parcel

Demolition, acquire structure  
and original parcel

### Structural

Hard structures - Seawalls, bulkheads,  
revetments, breakwaters

Groins, groin fields

Beachfills - Dunes, berms, combinations

Terminations - transition  
section or terminal groin





# Plan Formulation

## Initial Array of Plans

### Non-Structural

Institutional - Building codes, construction setbacks, floodplain regulations (existing condition)

Active - Retreat, within same parcel, no real estate cost

Relocation, to different parcel if available, acquire original parcel

Demolition, acquire structure and original parcel

### Structural

Hard structures - Seawalls, bulkheads, revetments, breakwaters

Groins, groin fields

Beachfills - Dunes, berms, combinations

Terminations - transition section or terminal groin





# Plan Formulation

## Final Array of Plans

### Non-Structural

Institutional - Building codes, construction setbacks, floodplain regulations (existing condition)

Active - Retreat, within same parcel, no real estate cost

Relocation, to different parcel if available, acquire original parcel

Demolition, acquire structure and original parcel

### Structural

Hard structures - Seawalls, bulkheads, revetments, breakwaters

Groins, groin fields

Beachfills - Dunes, berms, combinations

Terminations - transition section or terminal groin





# Formulating Length of Project

- Project divided into 26 reaches (numbered south to north)
- Applied typical dune and berm plan to all reaches
- Developed net benefits per reach, excluding recreation

**Results: Reaches 4-26 economically feasible**  
**Reach 1 not feasible**  
**Reaches 2-3 transition area**



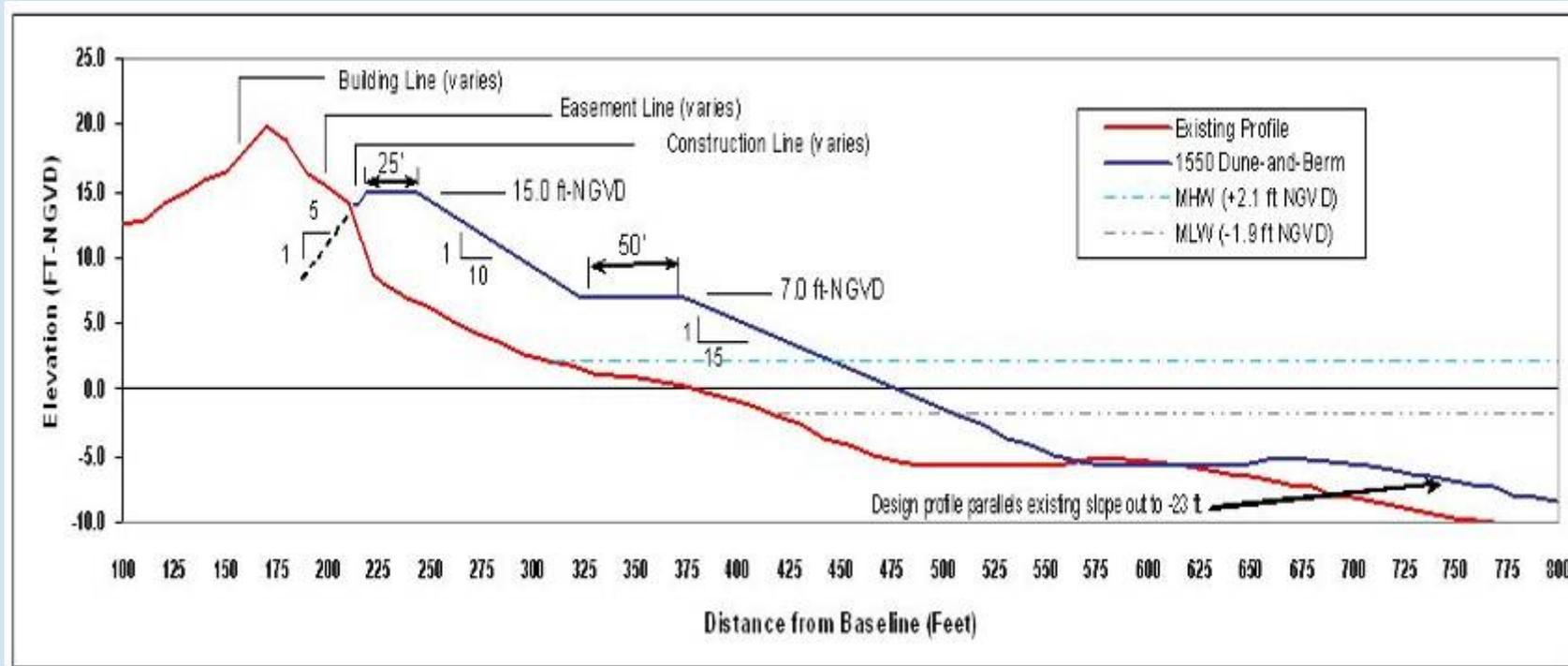
# Formulating Cross Section

- Evaluated combinations of:
  - Dune elevations between 11 and 17 feet
  - Berm widths between 25 and 75 feet
- **Highest Net Benefit (NED Plan) –  
15 foot elevation dune with 50 foot wide berm**



# Project Plan 1550 (NED Plan)

## Cross Section





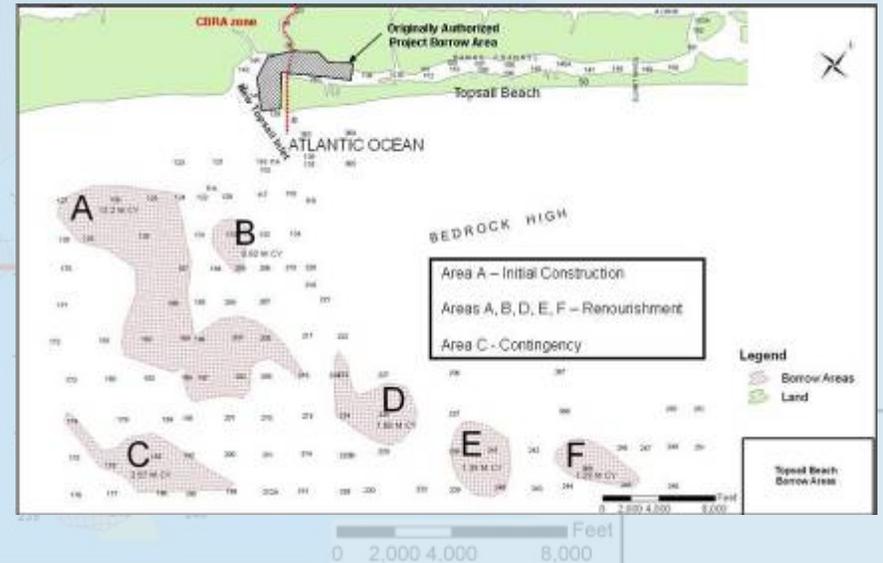
# Borrow Areas

## Originally Authorized Project

- Borrow areas were in New Topsail Inlet and Banks Channel
- These areas are now fully in the CBRA zone and Piping Plover Habitat area

## GRR Recommended Project

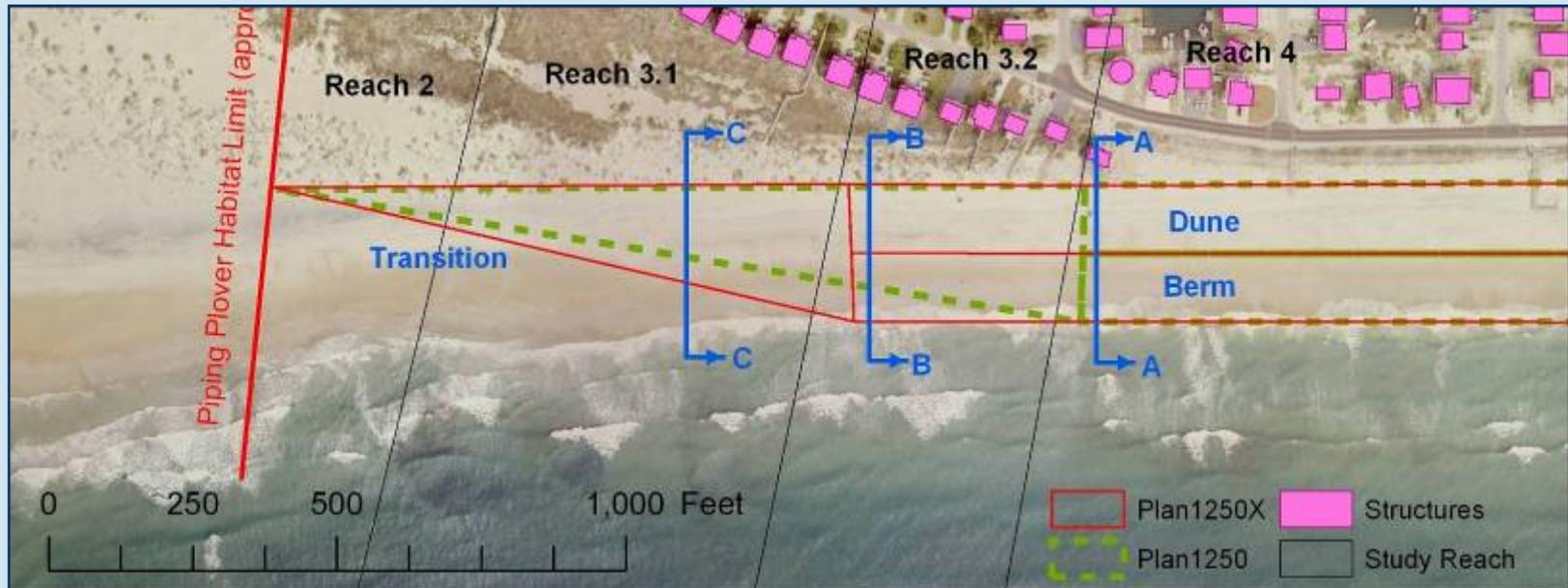
- Offshore borrow areas
- Avoids nearshore impacts
- Avoids hardbottom areas
- Complies with North Carolina sediment compatibility rules
- Sufficient capacity for 50-year project





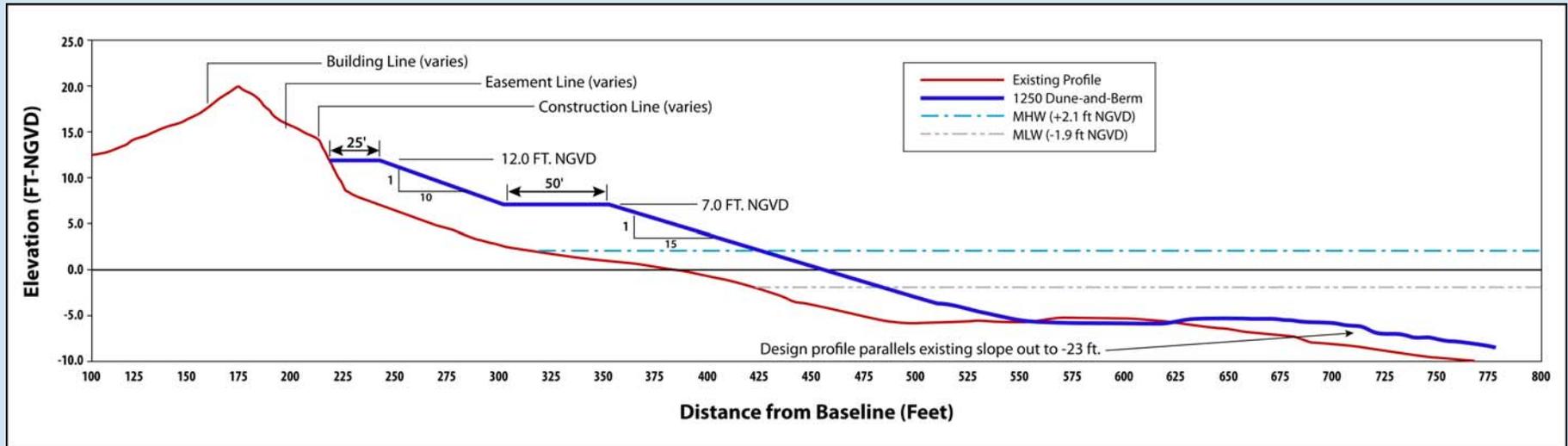
# Locally Preferred Modifications

- Extended length of dune and berm section 400 feet, through Reach 3.2
- Lowered dune elevation from 15 feet to 12 feet for the entire project





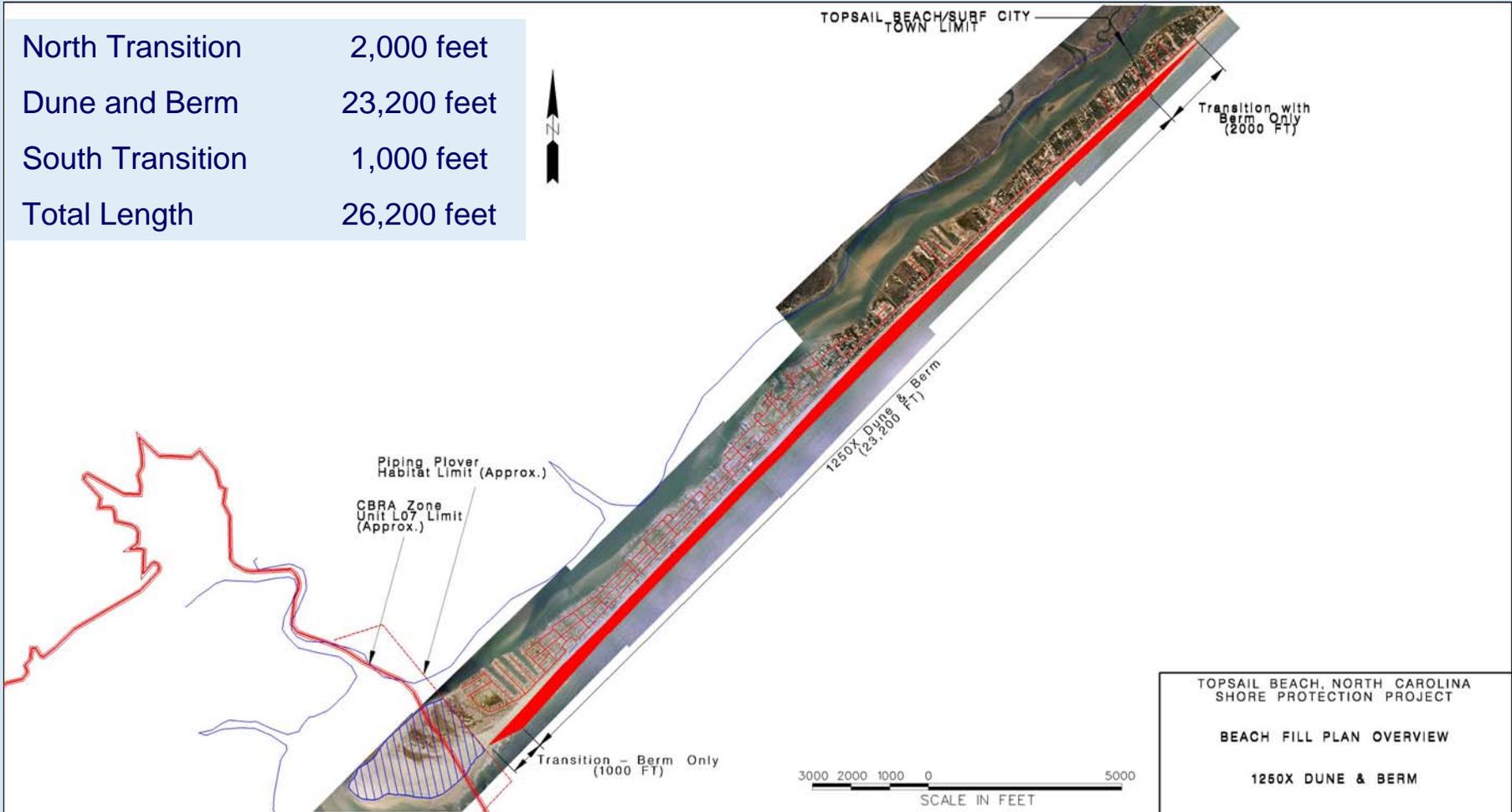
## Design Cross Section





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# Selected Plan = Locally Preferred Plan





# Economic Summary

## Compare Recommended/Locally Preferred Plan to NED Plan

50-yr period of analysis @ 4-7/8%, Price Level October 2007

ITEMS	SELECTED PLAN	NED PLAN
Total Initial Construction	\$32,131,000	\$43,028,000
Interest During Construction	\$275,000	\$369,000
Total Investment Cost	\$32,406,000	\$43,397,000
Renourishment Cost (4 year)	\$9,202,000	\$9,202,000
Total Annual Cost	\$4,119,000	\$4,710,000
Total Annual Benefits	\$13,590,000	\$14,255,000
BCR	3.3 to 1	3.0 to 1
Annual Net Benefits	\$9,471,000	\$9,545,000



# Differences in Risk – NED and LP Plan

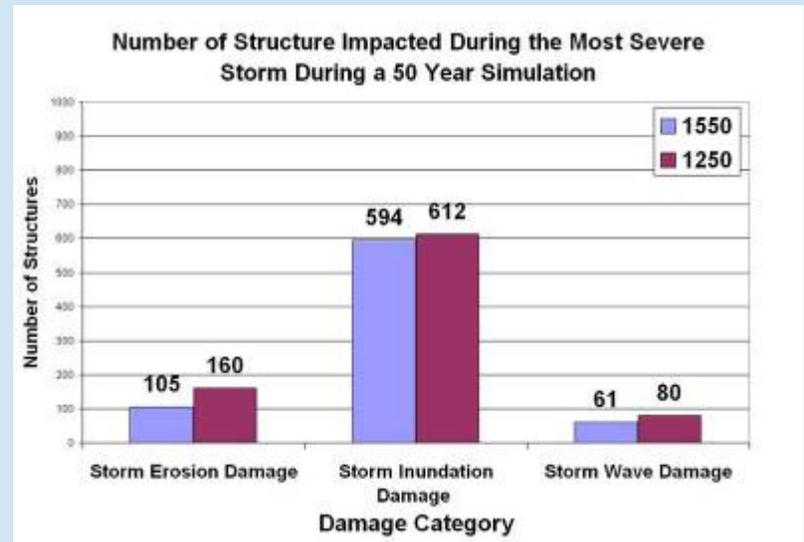
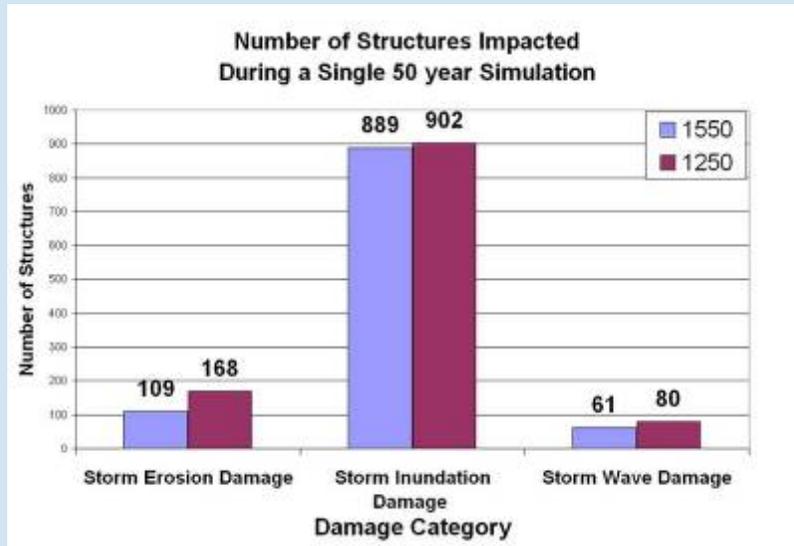
(one random 50-year scenario out of 1,000 in analysis)

Number of structures impacted -- most impacts are from a single, rare event

Damaged by	50-years		Worst Storm	
	NED	LP	NED	LP
Storm Erosion	109	168	105	160
Flood	889	902	594	612
Storm Wave	61	80	61	80

...all 50 years

...worst event in that 50 years ( ~85-yr event )

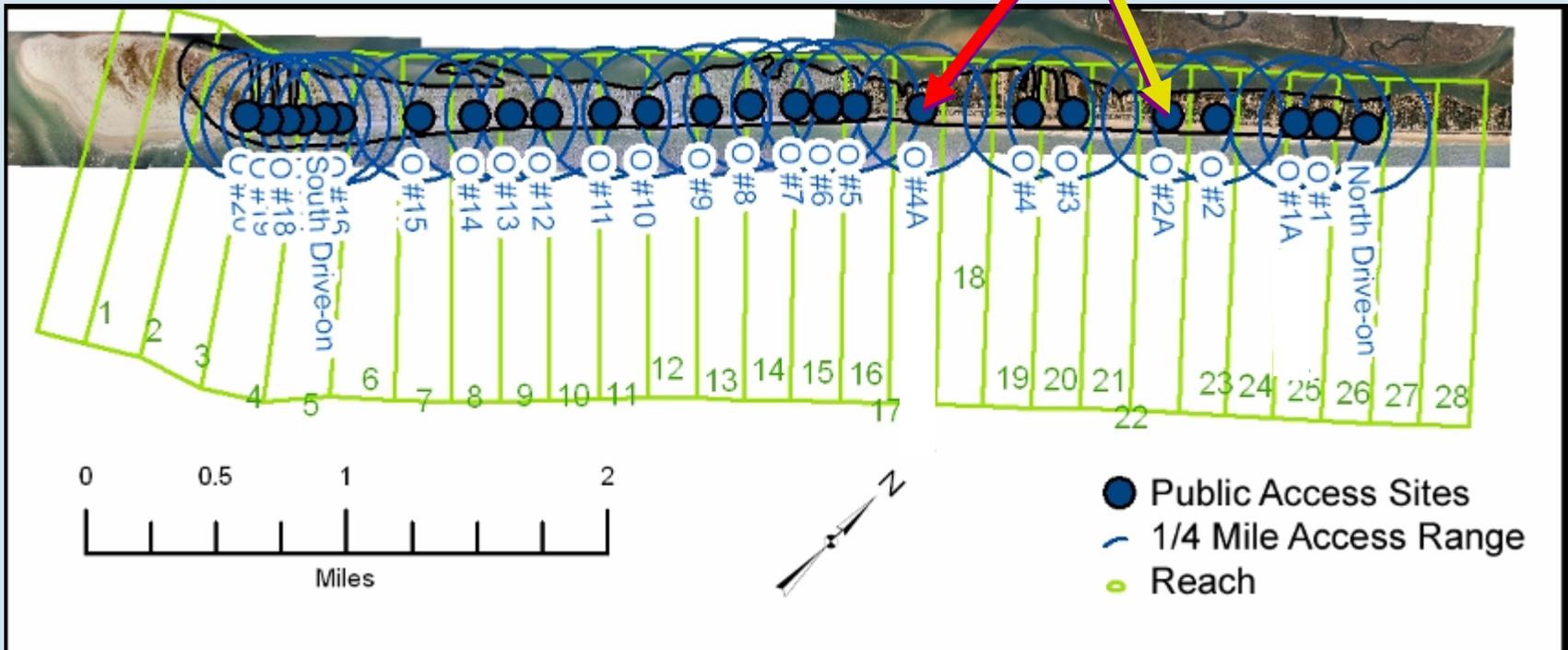




# Public Access

Topsail Beach intends to have the proposed access points and additional parking before execution of PCA. One of two highlighted (amber) has been acquired, not yet constructed. Other yet to be acquired (red).

Additional access to  
be provided





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# Reviews



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# Independent Technical Review

## NAD Review of Draft GRR & EIS

### ITR Team Leader – Jane Jablonski

- NED plan, costs, benefits, and environmental effects remained unchanged
- Added construction cost estimate escalated to project base year
- Final GRR certified by NAD on 14 April 2008



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# External Peer Review

- **PCX – CSDR (NAD) determined that EPR not required because:**
  - Project below cost threshold of \$40m
  - Life and safety concerns addressed by stringent evacuation plan
  
- **Implementing guidance not available yet for Sections 2034 and 2035 or WRDA 2007 – could require additional review during PED**



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# In-Progress Review, April 2006

- “The majority of prior policy review concerns appear to be addressed by the actions taken”
- The District was granted permission to proceed with concurrent Policy Review and Public Review of the Draft GRR
- The IPR instructions have been incorporated into the Final GRR & EIS



# Policy Review 2006

- Revise the environmental criteria to more accurately reflect current Corps environmental philosophy and policies
- Requested comparisons of GRR plan to “1992 NED Plan” in addition to Authorized Plan
- Elaborate on sponsor’s preference for the LPP
- All coordination and compliance should be demonstrated before Chief’s report may be signed



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# Public Review 2006

All Public Review comments have been given consideration and a response provided

The text of the Final GRR and EIS was revised, but there was no resulting change to either the NED Plan or the Selected Plan





# Cost Review 2007

## Walla Walla District, July 2007

- Increase risk regarding fuel costs and contingency
- Estimated Total First Cost and Renourishment Cost increased approximately 40% above Draft GRR & EIS costs
- The BCR of the Selected Plan changed from 4.0 to 3.3



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# Planning Model Certification

## December 2007

- GRANDUC – Generalized Risk AND Uncertainty – Coastal
  - Developed in 1990s, AFB PGM agreed acceptable to use, not a certified planning model
- Coordination through Coastal Storm Damage Reduction Center of Expertise
  - NAD performed ITR on application of GRANDUC to Topsail Beach
  - Concluded GRANDUC results are reasonable estimates of project benefits and costs



# Environmental Operating Principles

## Strive to Achieve Environmental Sustainability

Utilizes adaptive management framework including inspection and monitoring throughout the 50-year project life

## Consider Environmental Consequences

Avoids construction in critical seasons and locations; Avoids CBRA zone and hardbottoms; Ensures sediment compatibility

## Seek Balance and Synergy

Provides economic benefits to the Town of Topsail Beach and recreation and environmental benefits to the beach environment

## Accept Responsibility

Complies with National Environmental Policy and Endangered Species Act

## Assess and Mitigate Cumulative Impacts

Maximizes benefits to the system while avoiding and minimizing impacts to significant resources. No mitigation required.

## Understand the Environment

Engages all stakeholders, interests groups and agencies in an inclusive and open process. Meets full intent of NC Coastal Zone Management Program.

## Respect Other Views

Encourages and considers Public input throughout planning process





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# Actions for Change

- **Comprehensive Systems Approach**

- Integrated analysis of the Topsail Beach shoreline system and cumulative environmental effects.
- Adaptive management during construction & annual project monitoring program to reevaluate and adjust renourishment actions.

- **Risk Informed Decision Making**

- GRANDUC Model incorporated R & U

- **Communication of Risk to the Public**

- Describes anticipated risks such as residual storm damages and continued need for evacuation of the town pre-event

- **Professional & Technical Expertise**

- Independent Review



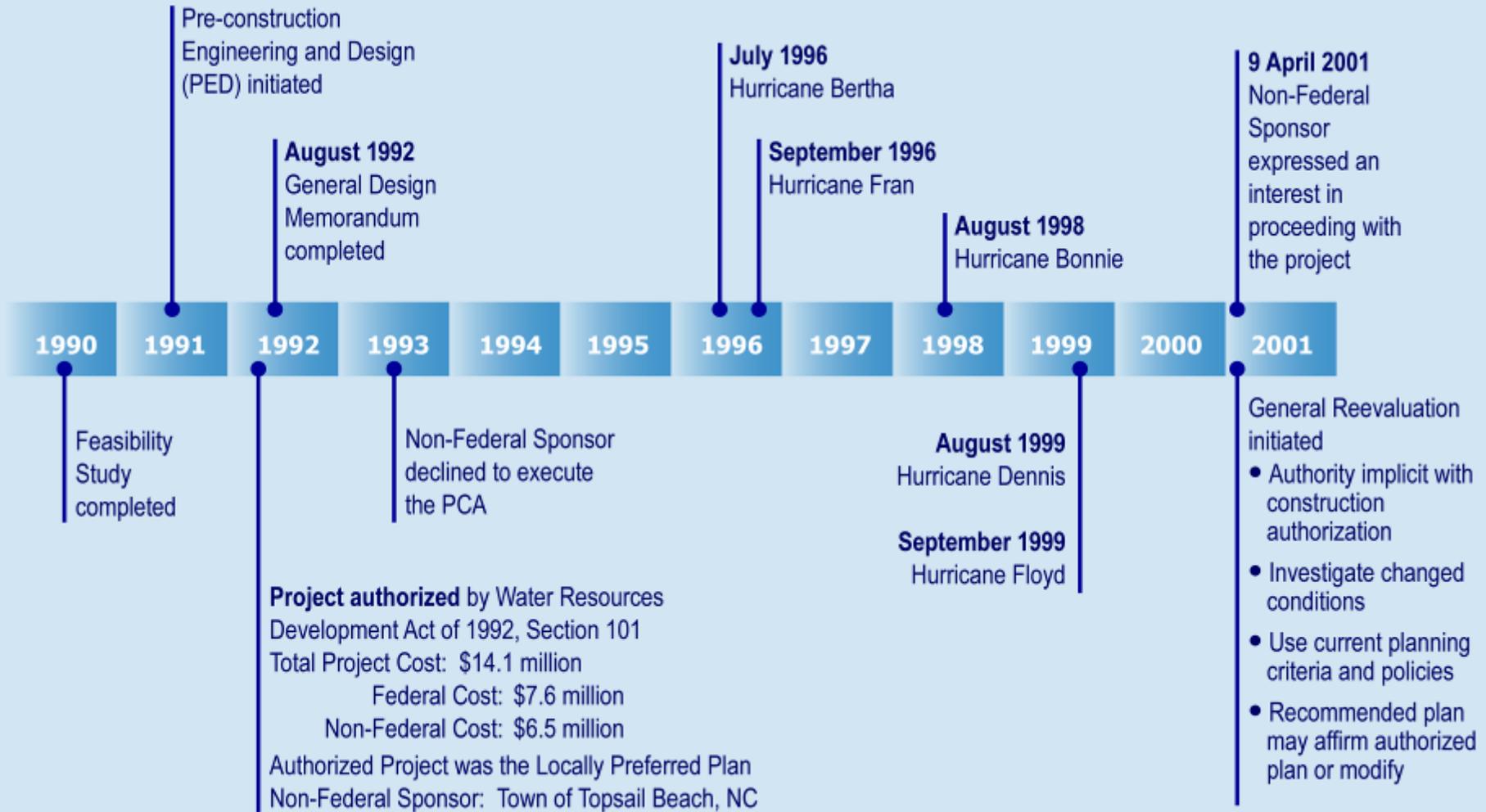
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# Project Timeline



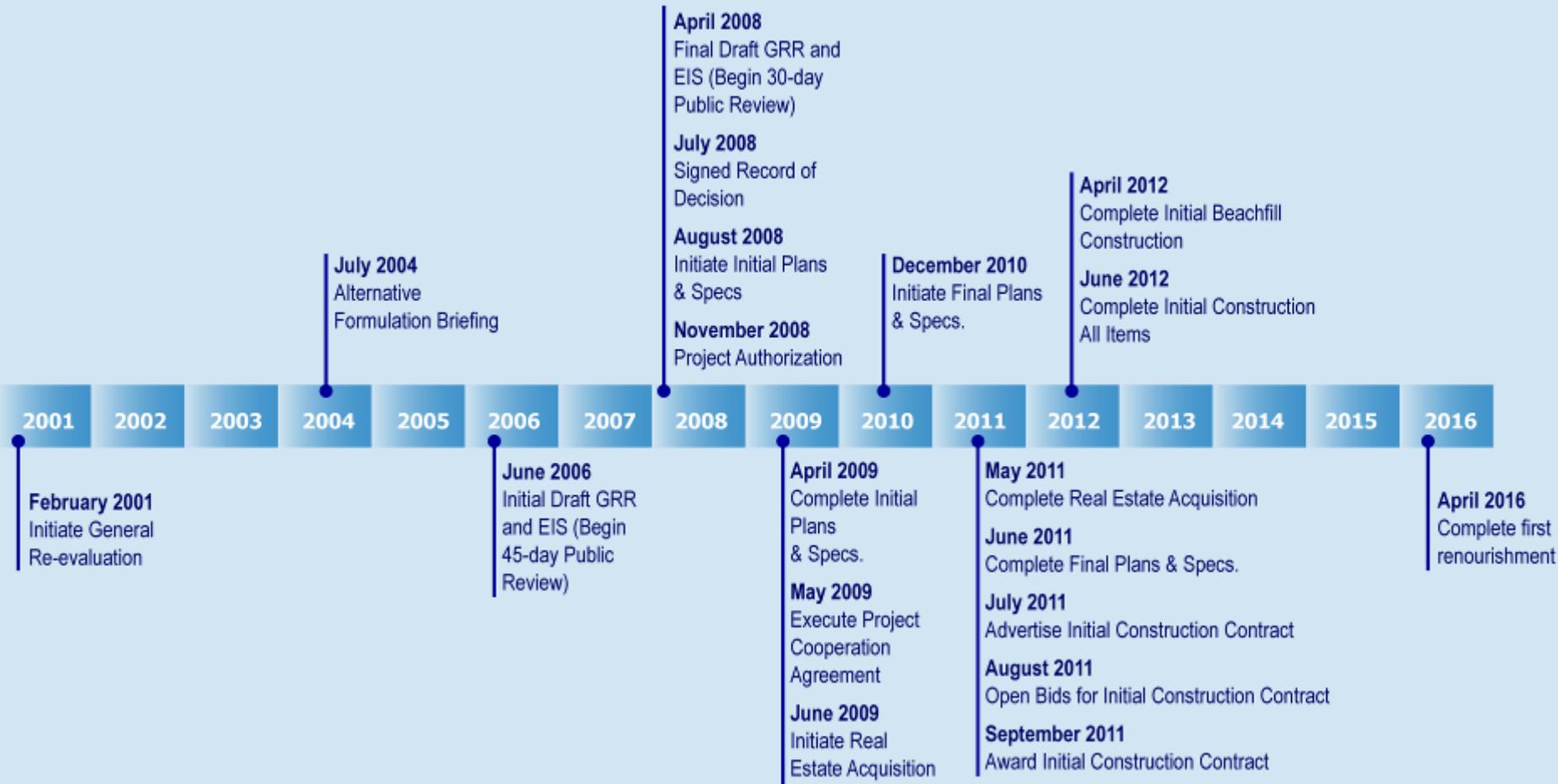


# Project History





# Project Schedule





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# Recommendation

That the Civil Works Review Board initiate State and Agency Review for the West Onslow Beach and New River Inlet (Topsail Beach), NC Coastal Storm and Damage Reduction project.



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# Questions



# Town of Topsail Beach, NC



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# Presentation Contents

- Town Biography
- Need for Project
- Town's Role
- Comparison of 1250X to 1550

# About Topsail Beach

- Incorporated 1963
- 500 Residents
- Summer Population 10,000+
- Structures -1,200
- Topsail Beach Length 5 Miles
- Building and Content Value- \$260M

# Our Need for the Project

- Turtles
- Tourism
- Tax Base

# Our Need for the Project...

## Turtles

- Endangered loggerhead sea turtles require a “dry sand” beach in order to nest.
- We have no beach at high tide -we need to restore lost nesting habitat.
- When the female comes ashore to the beach of her birth, if she cannot find a satisfactory nesting area, she returns to the ocean and jettisons her eggs
- Tourism
- Tax Base

# Our Need for the Project...

- Turtles
- Tourism
  - Tourism, particularly beach related tourism is a major industry and source of jobs for America and the state of NC
  - \$4 billion payroll in NC, 190,000 jobs
  - Topsail Beach is a national beach
    - “Middle America” Owners from 37 states
    - Top10 besides NC: VA, PA, MD, SC, OH, NY, FL, NJ, GA, CA
- Tax Base

# Our Need for the Project...

- Turtles
- Tourism
- Tax Base
  - 35% of our ocean-front homes are in imminent danger
  - Our only entry-exit highway is threatened
  - Our tax base also provides major support to Pender County
    - 10% of county tax revenue
      - 1% of population
      - 1/10% of area

# Our Role in Preparedness

- Financial

- Established 4 cents/\$100 (13% of our tax revenue) ad valorem tax for beach nourishment in 2002
- Doubled occupancy tax on rentals from 3% to 6% in 2002
- Receive \$100,000 per year from Pender County toward beach nourishment efforts

# Our Role in Preparedness...

- Construction
  - 30 Year Ocean Front Set Backs
  - No Living Space Below 100 Year Flood Elevation (+11)
  - All Buildings on Piles
  - 130 Mile Per Hour Wind Construction
  - 38' Height Limit (no high rise buildings)
  - Dune protection ordinances in place

# Our Role in Preparedness...

## Evacuation and preparedness

- Annual Staff Hurricane Preparedness Plan
- Newsletter to all property owners each spring regarding hurricane planning
- CTY Communications Technology
- Active Shoreline & Dune Protection Committee
- Well trained Police, Fire and Rescue

# Comparison of 1250X to 1550

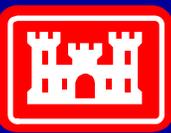
<b>Plan</b>	<b>1250X</b>	<b>1550</b>	<b>Difference</b>
Initial Construction	\$32,131,000	\$43,028,000	\$ 10,897,000
Interest during construction	\$ 275,000	\$ 369,000	\$ 94,000
<b>Total Investment Cost</b>	<b>\$ 32,406,000</b>	<b>\$ 43,397,000</b>	<b>\$ 10,991,000</b>
Renourishment Cost (4 year)	\$ 9,202,000	\$ 9,202,000	\$ -
Total annual Cost	\$ 4,119,000	\$ 4,710,000	\$ 591,000
Total Annual Benefits	\$ 13,590,000	\$ 14,255,000	\$ 665,000
BCR	3.3	3.0	1.1
<b>Annual Net Benefits</b>	<b>\$ 9,471,000</b>	<b>\$ 9,545,000</b>	<b>\$ 74,000</b>
<b>Simple Return on Investment</b>	<b>29.2%</b>	<b>22.0%</b>	<b>0.7%</b>

# Summary

- Our project:
  - Provides habitat for **turtles**
  - Supports national and local **tourism**
  - Protects our tax **base**
- Our residents and owners are well aware of hurricane dangers and have responsible policies and practices in place
- We've been judicious in picking a plan that will provide a good return on investment.

# Thank you!!!





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*Presentation  
to the*

***Civil Works Review Board***

**West Onslow Beach and New River Inlet  
(Topsail Beach)  
North Carolina**

***General Reevaluation Report and  
Environmental Impact Statement***

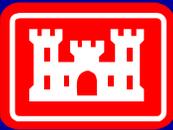
*by*

***BG Joseph Schroedel***

*Commander*

*South Atlantic Division*

*17 April 2008*



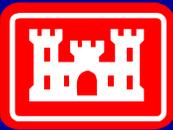
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## Key Partners

- Town of Topsail Beach, North Carolina
  - Mr. Steven Foster and Mr. Edward (Butch) Parrish
  - Mayor Howard M Braxton, Jr
- North Carolina Department of Environment and Natural Resources
- U.S. Fish & Wildlife Service
- National Marine Fisheries Service
- Minerals Management Service



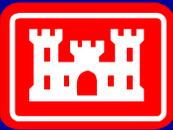
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# **West Onslow & New River Inlet Headquarters Team Members**

- Stacey Brown, Program Manager, SAD-RIT
- Steve Kopecky, Planning and Policy, SAD-RIT
- Yvonne Haberer, Planning and Policy, SAD-RIT
- Maria Chin, OWPR, Review Manager
- Roseann Bindner, Counsel
- Brenda Johnson-Turner, SAD-RIT, Real Estate
- Tom Hughes, OWPR
- Cliff Fitzsimmons, OWPR
- Mark Matusiak, OWPR
- Miguel Jumilla, OWPR



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# **West Onslow & New River Inlet SAD Team Members**

- Elden Gatwood, Plan Formulation
- Terry Stratton, Plan Formulation, Economics
- Dennis Barnett, Environmental
- Derrick Santos, Counsel
- William Thompson, Real Estate
- Kaiser Edmond, Engineering



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## Wilmington District Study Team

Glenn McIntosh	Project Manager
COL Pulliam	District Engineer
Christine Brayman	DDEPM
Coleman Long	Chief of Planning
Doug Greene	Lead Planner
Jenny Owens	Lead Environmental
Doug Piatkowski	Environmental
Tony Young	Coastal Engineering
Richard Kimmel	Cultural Resources
Ray Livermore	Geotechnical
John Caldwell	Cost Engineering
Belinda Estabrook	Real Estate
George Ebai	Recreation
Frank Snipes	Economics
Justin McCorcle	Counsel



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# West Onslow & New River Inlet Independent Technical Review Team Planning

Joe Vietri	PCX-CSDR, Director	CENAD
Larry Cocchiere	PCX-CSDR, Deputy Dir	CENAD
Ed O'Leary	GRANDUC ITR	CENAE
Jane Jablonski	ITR-Lead, ITR-Planning	CENAP
Beth Brandreth	Environmental	CENAP
Robert Dunn	Cultural Resources	CENAP
Bob Selsor	Economics	CENAP
Ed Rossman	Recreation	CESWT

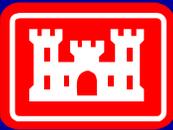


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# **West Onslow & New River Inlet Independent Technical Review Team Engineering & Real Estate**

Mike Carnivale	Geotechnical	CENAP
Randy Wise	Coastal Engineering	CENAP
Jennifer Laning	Civil Engineering	CENAP
Bill Welk	Cost Engineering	CENAP
Dan Kelly	Geotechnical	CENAP
Tom Heary	Civil Engineering	CENAP
Cam Chasten	Civil Engineering	CENAP
Frank Palmer	Real Estate	CENAB
Fred Engesser	Real Estate	CENAB
Craig Homesly	Real Estate	CENAB



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# **West Onslow & New River Inlet Independent Technical Review Team Cost and OVEST**

Jim Neubauer

Kim Callan

Jeff Fersner

Ron Burkhard

Cost Review

Cost Review

Cost Review

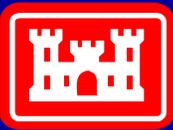
OVEST

CENWW-EC-X

CENWW-EC-X

CESAW-TS-EE

CESAC-VE



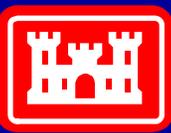
# Rationale for SAD Support

- Concur with District Commander's findings & recommendation of the Locally Preferred Plan (LPP) vs. the National Economic Development (NED) Plan
- LPP
  - Supported by State/Federal Resource Agencies
  - 8% less Storm Damage Reduction benefits than NED
  - 25% less initial construction cost than NED
  - Supported by Sponsor
- Report complies with all applicable policies & laws in place at this time.
- Plan is consistent with original project authorization



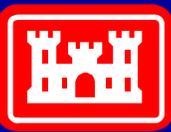
## **Rationale for SAD Support, cont'd**

- No Project Cost Issues (GRR Cost Sharing Resolved)
- No Public Access or Parking Issues
- Simple Berm and Dune Design
- Ample Borrow Sources for construction and renourishment
- No environmental issues
- Plan will provide positive Hurricane and Storm Damage Reduction, Recreation, and Reduced Emergency Costs Benefits
- Anticipate favorable response to the draft Chief's Report.



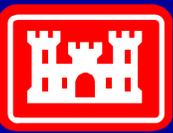
# Certification of Legal & Policy Compliance

- Legal certification of the final GRR and EIS made by SAW District Counsel on 29 Oct 07.
- Technical and Policy Compliance:
  - Independent Technical Review (ITR) certification completed,
    - Initial ITR completed 17 Mar 2006.
    - Re-verified ITR completed 14 April 2008
  - GRANDUC Model concurred in by Planning PCX Feb 08.
  - Value Engineering Certification – 25 Jan 2008
  - Policy compliance issues have been resolved.



# SAD Quality Assurance Activities

- Continuous involvement throughout development of the GRR.
- SAD Final Report Processing Checklist used to keep PDT focused on policy and ensure proposed plan reflects district leadership support.
- Review of Policy Compliance Memo: all issues have been adequately addressed.
- Examples of policy issues resolved.
  - Recommendation of LPP vs NED plan cleared through ASA's office



US Army Corps  
of Engineers

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# **SAD Recommendation**

- Release for State and Agency Review
- Complete Chief's Report

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# Civil Works Review Board

## *Significant Policy Review Concerns*

Maria Chin

Office of Water Project Review

Policy and Policy Compliance Division

Washington, DC – April 17, 2008



# Policy Compliance Review

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- Cost Sharing General Reevaluation
- Recommendation of a Locally Preferred Plan
- Independent Technical Review
- External Peer Review and Safety Assurance Review



# Issue: Cost Sharing General Reevaluation

Issue/Concern: Cost-sharing for this study should be 50/50.

Reason/Basis: 2004 ASA(CW) letter reaffirmed and clarified 50/50 cost-sharing for studies expanding or substituting plans for authorized projects.

Significance: An additional 25% of study cost may need to be recouped from the non-Federal sponsor.

Resolution:

- SAD RIT coordinated resolution with OASA(CW).
- Study would expand project by 27 percent in length.
- 27% of total study cost will be cost-shared 50/50.
- Non-Federal sponsor provided a letter of intent on 11 April 2008.

Resolution Impact: Non-Federal sponsor will contribute about \$236,000 more.



# Issue: Recommendation of a Locally Preferred Plan

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Issue/Concern: Recommendation of a Locally Preferred Plan.

Reason/Basis: P&G requires ASA(CW) approval to recommend a plan other than the NED Plan.

Significance: Report should not be released until after ASA(CW) waives the NED Plan requirement, or the report is revised to recommend the NED Plan.

Resolution: SAD RIT has requested a policy waiver from ASA(CW) on 9 April 2008.

Resolution Impact: May delay report release and filing for a brief period, pending a favorable ASA(CW) decision; longer if the request is denied.



# Issue: Independent Technical Review

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Issue/Concern: Lack ITR documentation and certification for the final report.

- Certification based on draft report ITR.
- Documentation of the draft report ITR does not demonstrate ITR team views on issue resolution.
- ITR needs to confirm comments have been incorporated in final report.
- The draft and final reports recommend different plans.
- No basis for assessing scope of changes from draft to final and resulting review needs.

Reason/Basis: ER 1105-2-100, Appendix H and EC 1105-2-408



# Issue: Independent Technical Review (cont.)

Significance: No basis for HQUSACE to determine that ITR was performed on the final product and that ITR issues were resolved.

Resolution: Wilmington has worked closely with the ITR team to assess changes between the draft and final reports and to document agreement or lack thereof between the PDT and the ITR team regarding the resolution of individual ITR issues. ITR certification for the final report has been provided to Wilmington District. HQUSACE is awaiting the ITR certification and documentation package. Report should not be released or filed until requisite documentation and certification are provided to HQUSACE.

Resolution Impact: This issue remains unresolved.



# Issue: External Peer Review and Safety Assurance Review

Issue/Concern: EPR and Safety Assurance Review (SAR) have not been conducted.

Reason/Basis: Sections 2034 and 2035 of WRDA 2007 may require both reviews.

Significance: Whether the failure of the project could pose a significant threat to human life; legal compliance.

Resolution: If required, conduct EPR and SAR during PED phase.

- EPR not necessary under current guidance (EC 1105-2-408).
- No current guidance requiring SAR.
- WRDA 2007 implementation guidance on both is pending and release is expected within a month or two (no grandfathering).

Resolution Impact: No delays.



# OWPR Recommendation

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Release report for S&A Review and filing with EPA when ASA(CW) responds to waiver request and ITR process is complete.

