DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
SOUTH ATLANTIC DIVISION
60 FORSYTH ST, SW, ROOM 10M15
ATLANTA, GEORGIA 30303-3490

REPLY TO
ATTENTION OF:

CESAD-PDP

20 September 2011

MEMORANDUM FOR Commander, Wilmington District (CESAW-TS-P/Elden Gatwood)

SUBJECT: Approval of Review Plan for Integrated Feasibility Report and Environmental Impact Statement for Bogue Banks, Carteret County, North Carolina

1. References:

a. Memorandum, CESAW-TS-P, 15 August 2011, subject above.

b. EC 1165-2-209, Civil Works Review Policy, 31 January 2010.

2. In accordance with EC 1165-2-209, Civil Works Review Policy, 31 January 2010, the Review Plan (RP) dated January 2011, revised September 2011, for the Integrated Feasibility Report and Environmental Impact Statement for Bogue Banks, Carteret County, North Carolina (enclosure), has been reviewed by this office and is approved.

3. The District should take steps to post the SAD-approved Final RP and a copy of this approval memorandum to the SAW District public internet website and provide a link to the National Planning Center of Expertise for Coastal Storm Damage Reduction (CSDR-PCX) website for their use. Before posting to the website, the names of Corps/Army employees should be removed.

4. The SAD point of contact for this action is Ms. Karen Dove-Jackson, CESAD-PDP, (404) 562-5225.

FOR THE COMMANDER:

Encl

WILBERT V. PAYNES
Chief, Planning and Policy
Community of Practice

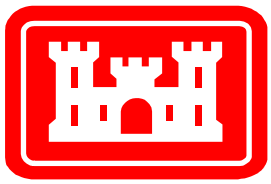
Bogue Banks, Carteret County,
North Carolina

Integrated Feasibility Report and Environmental Impact Statement for Bogue Banks, Carteret County, North Carolina

REVIEW PLAN

September 2011

Approval Date: 20 September 2011



US Army Corps of Engineers

Wilmington District

ACRONYMS & ABBREVIATIONS

AFB – Alternative Formulation Briefing

ATR – Agency Technical Review

CESAW – US Army Corps of Engineers, South Atlantic, Wilmington

Cost DX - Walla Walla District Directorate of Expertise for Civil Works Cost Engineering

CWRB – Civil Works Review Board

EIS – Environmental Impact Statement

FCSA – Feasibility Cost Sharing Agreement

FEIS – Final Environmental Impact Statement

FSM – Feasibility Scoping Meeting

GI – General Investigations

HQ – Headquarters

IEPR – Independent External Peer Review

LOI – Letter of Intent

NEPA – National Environmental Policy Act

PCX-CSDR - National Planning Center of Expertise for Coastal Storm Damage Reduction

PDT – Project Delivery Team

PMP – Project Management Plan

P&S – Plans & Specifications

RP - Review Plan

SAD – South Atlantic Division

Table of Contents

1. Introduction

This Review Plan (RP) is a collaborative product of the Project Delivery Team (PDT), the National Planning Center of Expertise for Coastal Storm Damage Reduction (PCX-CSDR) and the Walla Walla District Directorate of Expertise for Civil Works Cost Engineering (Cost DX). This RP was developed in accordance with EC 1165-2-209, which establishes the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision documents through independent review.

a. References

(1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
(2) EC 1105-2-412, Planning Models Improvement Program: Model Certification, 31 March 2011
(3) Engineering Regulation (ER) 1110-2-12, Quality Management, 30 Sep 2006

2. Study Background

a. Title, Subject, and Purpose of the Decision Document. The *Integrated Feasibility Report and Environmental Impact Statement for Bogue Banks, Carteret County, NC* shall be the decision document. The Bogue Banks Study is being pursued under the Corps of Engineers' General Investigation (GI) Program. The integrated Feasibility Report and Environmental Impact Statement (EIS) is being conducted in response to the following resolution adopted July 23, 1998:

> *Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, that the Secretary of the Army is requested to review the report of the Chief of Engineers dated November 27, 1984, on Bogue Banks and Bogue Inlet, North Carolina, and other pertinent reports, to determine whether any modifications of the recommendations contained therein are advisable at the present time in the interest of shore protection and related purposes for Bogue Banks, North Carolina.*

The area known as Bogue Banks is a barrier island located entirely within Carteret County on the central North Carolina coast. The island faces the Atlantic Ocean on the south and extends approximately 25.4 miles from Beaufort Inlet on the east to Bogue Inlet on the west. Bogue Sound separates Bogue Banks from the mainland to the north. Communities of the island, from east to west, include Fort Macon State Park, Atlantic Beach, Pine Knoll Shores, Salter Path, Indian Beach, and Emerald Isle. The sponsors' interest is in developing a plan for reducing storm damages. The study area extends landward approximately 500 feet from the shoreline. Seaward the study area extends from the shoreline approximately 1 mile. The study area also includes offshore borrow areas lying 1 to 8 miles from the shoreline and borrow areas in Beaufort Inlet and Bogue Inlet.

The Bogue Banks feasibility study is investigating measures and plans for coastal storm damage reduction. The study is also documenting incidental recreation benefits. Being located between Cape Lookout and Cape Fear, Bogue Banks is a frequent target for hurricanes and tropical storms tracking along the mid-Atlantic coast. In addition to these direct landfalling storms, many storms that have passed offshore without making landfall have also impacted the study area. Local impacts to the study area have varied depending on the landfall location and strength of the storm.

Typical solutions considered for this study area are berm and dune beachfills using material dredged from offshore borrow sites, and in some cases building relocations, or coastal structures such as groins or breakwaters.

The estimated range of initial construction cost for the various alternatives varies between $100 million and $200 million, and estimated annual renourishment costs are approximately $5 million. Renourishment would continue through 50 years if the project is authorized.

3. Key Personnel

Key PDT members are shown in the table below.

ROLE	NAME	ORGANIZATION
Project Manager		CESAW-PM-C
Program Manager		CESAW-PM-P
Lead Planner		CESAW-TS-PF
Biologist		CESAW-TS-PE
Cultural Resources		CESAW-TS-PE
Coastal/H&H		CESAW-TS-EC
Coastal/H&H		CESAW-TS-EC
Geotechnical		CESAW-TS-EG
Cost Engineering		CESAW-TS-EE
Economics		CESAW-TS-PF
Economics, Recreation		CESAW-TS-PF
Real Estate		CESAS-RE-RP
Counsel		CESAW-OC

The PDT also includes the non-Federal Sponsor, stakeholders, and resource agencies.

For more information regarding the RP, the project manager for the feasibility study may be contacted as follows:

Project Manager
US Army Corps of Engineers – Wilmington District
CESAW-PM-C
69 Darlington Avenue
Wilmington, North Carolina 28403
Phone: (910) 251-4671 **Fax:** (910) 251-4965

Agency Technical Review Team Leaders

ATR will be led by PCX-CSDR, with participation by Cost DX.

National Planning Center of Expertise for Coastal Storm Damage Reduction PCX-CSDR
US Army Corps of Engineers – North Atlantic Division
CENAD-PSD-P
https://rbc.nado.ds.usace.army.mil/Hurricane%20and%20Storm%20Damage/HSDP-PCX%20Web%20Page.htm
Phone: (718) 765-7070

Walla Walla District Directorate of Expertise for Civil Works Cost Engineering
CENWW-EC-X
Phone: 509-527-7511

4. Conduct of Review

EC 1165-2-209 outlines four levels of review (in addition to the public review that occurs as part of the NEPA process) – District Quality Control (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Review. Additionally, as per EC 1105-2-412, all "planning models" used in the study will undergo model certification. Formal reviews generally occur for major report milestones – the Feasibility Scoping Meeting (FSM) report, the Alternative Formulation Briefing (AFB) report, the draft feasibility report, and the final feasibility report. This study does not include the FSM milestone, therefore the first major milestone will be the AFB. The following sections discuss how the various levels of review and model certification will be conducted for the Bogue Banks feasibility study. A summary of the peer review process is included as Attachment 1.

District Quality Control (DQC)

DQC is an internal quality assurance process that occurs at all stages of the feasibility report development, and will be managed by Wilmington District. DQC will be performed by a team from within SAW not involved in the direct conduct of the study, and covers both technical quality, and to the extent possible, policy compliance of the document. The DQC will be conducted in accordance with the Wilmington District and South Atlantic Division (SAD) Quality Manuals.

Agency Technical Review (ATR)

ATR is undertaken to "ensure the quality and credibility of the government's scientific information". For this study, the ATR will be managed by the CSDR-PCX and the Cost

DX (which solely handles review of the cost engineering aspects of the report). The ATR will be conducted by skilled and experienced personnel in another USACE District, who have not had any prior involvement with the study. Preferably, the ATR team membership will also be entirely from outside of the USACE South Atlantic Division (SAD), which is the home division of the USACE Wilmington District. It is anticipated that, at a minimum, expertise in the following disciplines will be required from the ATR team:

- **Plan Formulation**: The reviewer should have the ability to review the planning process which should address the Nation's water resources needs in a systems context and explore a full range of alternatives in developing solutions. The reviewer should be able to recognize innovative solutions and the application of the full range of the Corps programs and authorities that are integral to the planning process. The reviewer should thoroughly understand the Planning Guidance Notebook (ER-1105-100) and the Water Resources Council's Principals and Guidelines, particularly as it relates to Coastal Storm Damage Reduction studies.
- **Economics:** The reviewer should have the ability to review the economics analysis done as part of a Coastal Storm Damage Reduction project, including the analysis of recreation benefits. Reviewer should have an understanding and knowledge of the application of The Planning Guidance Notebook, ER 1105-2-100 Appendix E Sections IV (Coastal) and VII (Recreation) as well as Appendix D, Economic and Social Considerations, in addition to the forthcoming Coastal Storm Risk Management - NED Manual (near finalization as of Sept 2011). Additional detail for the Planning Guidance Notebook can be found in ER 1165-2-130, Federal Participation in Shore Protection. The economics reviewer should also be familiar with Beach-FX software to ensure the adequacy of the economic inputs into the model.
- **Coastal Engineering:** The reviewer should have experience in the design; construction and maintenance of coastal storm damage reduction projects. He should understand the life-cycle simulation NED analysis which uses a risk and uncertainty approach, and should be familiar enough with the Beach-FX software to ensure the adequacy of the coastal engineering inputs into the model. The reviewer should have working experience over multiple projects with the computer models used by coastal engineers, and with the issues regarding sea level rise.
- **Environmental and NEPA Compliance:** The reviewer should be familiar with all National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) requirements as well as have experience with Endangered Species Act (ESA), Magnuson-Stevens Fishery and Conservation Management Act Essential Fish Habitat (EFH), and the Marine Mammal Protection Act (MMPA). The reviewer should have a specific knowledge and understanding of dredging and beach nourishment related impacts associated with Coastal Storm Damage Reduction projects on the Mid-Atlantic coast. Specific high value habitats of interest within the study area include, but are not limited to: inlet complex, ebb shoal, cape shoal, hard bottom, and soft bottom communities.

- **Cultural Resources:** The reviewer should have the ability to review cultural resources studies pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and 36 CFR 800. The reviewer should thoroughly understand Appendix C-4 (Cultural Resources) of the Planning Guidance Notebook (ER-1105-100), particularly as it relates to Coastal Storm Damage Reduction studies.
- **Geotechnical Engineering:** The reviewer should have knowledge of how coastal processes relate to geotechnical engineering, how to apply the NC Sediment Criteria to borrow materials, and coastal geology. This should include being familiar with geophysical subsurface investigation methods, the drilling and sampling process, boring logs, soil testing methods, grain size distribution data, and beach overfill ratio determination.
- **Real Estate:** The Real Estate reviewer is to have expertise in the real estate planning process for cost shared and full federal civil works projects, relocations, report preparation and acquisition of real estate interests. The reviewer should have a full working knowledge of EC 405-2-12, Real Estate Planning and Acquisition Responsibilities for Civil Works Projects and Public Law 91-646. The reviewer should be able to identify areas of the REP that are not in compliance with the guidance set forth in EC405-2-12 and should make recommendation for bringing the report into compliance. All estates suggested for use should be termed sufficient to allow project construction, and the real estate cost estimate should be validated as being adequate to allow for real estate acquisition.
- **Cost Engineering:** The reviewer must be a cost estimating specialist. It is imperative that estimates be prepared by, and reviewed under the supervision of, personnel who are competent in construction cost estimating. The reviewer must possess a working knowledge of construction of beachfill projects, and be capable of making professional determinations based on their experience.

Additional disciplines will be added as deemed appropriate throughout the course of the study. ATR will occur at all major report milestones.

Independent External Peer Review

Independent External Peer Review (IEPR) is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of the USACE is warranted. Per EC 1165-2-209, a Type I (for project studies) IEPR is mandatory if any of the following criteria are true: the project poses a significant threat to human life, the estimated total cost of the project is greater than $45 million, the Governor of an affected State requests a peer review by independent experts, or the Chief of Engineers determines that the project study is controversial due to significant public dispute over either the size, nature, or effects of the project or the economic or environmental costs or benefits of the project. Other considerations include whether the project will generate significant interagency interest, will entail an Environmental Impact Statement (EIS), or will include novel or precedent setting approaches. It is anticipated that the total cost for this project

will be greater than $45 million, and will also require an EIS. Therefore an IEPR will be conducted for this study. The IEPR will be managed by an Outside Eligible Organization, external to the USACE. Panel members will be selected using the National Academies of Science (NAS) policy for selecting reviewers.

The IEPR reviewers should have the combined, following expertise and requisite experience:

Technical areas related to **geotechnical engineering** (1 expert):

- At least ten years of experience
- Registered professional engineer.
- M.S. or higher in geotechnical engineering.
- Demonstrated experience in geotechnical studies and design of stabilizing dunes, bluffs, and beach berms.
- Familiar with geotechnical practices used in North Carolina.

Technical areas related to **economics** (1 expert):

- At least ten years of experience
- M.S. or higher in economics.
- Experience in coastal economic evaluation and flood risk evaluation.
- Familiarity with the BEACH-*fx* program required.

Technical areas related to **coastal engineering** (1 expert):

- At least ten years of experience
- M.S. or higher in engineering.
- Registered professional engineer with experience in coastal and hydraulic engineering with an emphasis on large public works projects **OR**
- Professor from academia with extensive background in coastal processes and hydraulic theory and practice.
- Familiar with USACE application of risk and uncertainty analyses in coastal storm damage reduction studies.
- Familiar with standard USACE coastal, hydrologic, and hydraulic computer models.
- Familiarity with the *s*-Beach and BEACH-*fx* programs required.

Technical areas related to **environmental/biology** (1 expert):

- At least ten years of experience
- Demonstrated experience with projects on the mid-Atlantic coast of the United States.
- Knowledge of tidal salt marshes, construction impacts on the marine and terrestrial ecology of coastal regions and characterization of benthic communities
- Familiar with all National Environmental Policy Act (NEPA) EIS requirements as well as have experience with ESA, EFH, and MMPA.

Technical areas related to **plan formulation** (1 expert):

- At least ten years of experience
- Experience in coastal planning.
- Familiar with USACE plan formulation standards and procedures.

Upon conclusion of the IEPR, the OEO will provide to the District a Review Report, which will include the names and credentials of reviewers, the reviewers' charge, the nature of their review and findings and conclusions, and a verbatim copy of the reviewers' final comments. The Corps response to the report will come from the Chief of Engineers, and will include the Corps agreement or disagreement with each individual comment contained in the report, any actions taken in response to each comment, and the reason those actions are believed to satisfy the key concerns stated in the report. Once finalized, the Corps response will be publicly disseminated, however, the names and credentials of the IEPR reviewers will not be disclosed.

Policy and Legal Review
Policy and legal review is conducted at all the major report milestones, in order to confirm that the study is in compliance with the appropriate laws and USACE policies. Policy review is conducted by the USACE headquarters (passed on through SAD), and legal review is handled by Wilmington District Office of Counsel.

Public Review/Comment: Once completed, the *Integrated Feasibility Report and Environmental Impact Statement for Bogue Banks, Carteret County, NC* will be disseminated to resource agencies, interest groups, and the public as part of the National Environmental Policy Act (NEPA) environmental compliance review. All significant and relevant public comments will be provided as part of the review package to Peer Reviewers as they are available and may include but not be limited to: scoping letters, meeting minutes, other received letters, and emails.

DrChecks: A software program useful to coordinate various document comments and responses electronically, DrChecks, will be used to conduct the ATR and IEPR.

Sponsor In-Kind Contributions to Study: For this study the maximum in-kind contributions allowed from the Sponsor are $200,000. This is an aggregate amount for in-kind work that was performed from FY01 thru FY03. Work in-kind involved various biological monitoring, sampling, and survey work. Work in-kind summaries were submitted to the Wilmington District for review in July 2003. No further in-kind contributions are expected. Results from the sponsors' in-kind contributions are incorporated into the feasibility report/EIS and appendices, and are reviewed as part of the ATR and IEPR process.

Model Certification
According to EC 1105-2-412 – Model Certification, models can be divided into two general categories – "planning models" and "engineering models used in planning studies". Currently, only the first category – "planning models" need to go through the planning model certification or approval process.

The *Integrated Feasibility Report and Environmental Impact Statement for Bogue Banks, Carteret County, NC* will use one model which falls into the "planning model" category, which is the Beach-*fx* model. . BEACH-*fx* is a prototype coastal storm damage reduction engineering-economic software tool. The model consists of a Monte-Carlo simulation that evaluates reach erosion, physical storm impacts, and damages that occur from a storm passing a shore. The model is used as a tool to assist engineers in coastal nourishment and rehabilitation studies. This Bogue Banks feasibility study will be the first time the Wilmington District will be using BEACH-*fx*. BEACH-*fx* is a certified USACE corporate model.

The only engineering model being used on the study is S-BEACH, which has been approved for use by the USACE engineering community of practice.

5. Anticipated Peer Review Schedule.

REVIEW PHASE	COMPLETION DATE	
Agency Technical Review AFB Materials	October	2011
Alternative Formulation Briefing (AFB)	April	2012
ATR for Draft Feasibility Report & EIS	July	2012
HQ Policy Review of Draft Feasibility Report & EIS	October	2012
IEPR for Draft Feasibility Report & EIS	February	2013
Draft Feasibility Report & EIS / NEPA Public Review	March	2013
ATR of Final Report & EIS	June	2013
Civil Works Review Board	October	2013
Final EIS / NEPA Public Review (MSC Commanders Public Notice)	December	2013

ATTACHMENT 1

REVIEW PLAN CHART

REVIEW PLAN	
FEASIBILITY PHASE	
Study Product or Milestone	Review by
Feasibility Scoping Meeting	(not part of this study)
Value Engineering Package	SAD VE Program Manager PDT
Alternative Formulation Briefing	PDT, Supervisors, ATR Team
Draft Feasibility Report & EIS Risk Analysis Cost Engineering Policy	PDT, Supervisors, ATR Team, EPR Team, OC, Public, State and Federal Agencies Cost DX Cost DX HQ, SAD
CWRB Review Package	PDT, Supervisors
Final Feasibility Report & EIS	CWRB
Final Feasibility Report & EIS	Agencies, Public & Private Entities
Chief of Engineers Report	HQ→ ASA(CW)→ OMB→ Congress

A Scoping Letter during the Reconnaissance Phase provided the Public the opportunity to share any known concerns.