DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NORTH ATLANTIC DIVISION
FORT HAMILTON MILITARY COMMUNITY
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CENAD-PD-PP

SEP 20 2016

MEMORANDUM FOR Commander, Philadelphia District, Wanamaker Building 100 Penn Square East Philadelphia, PA 19107-3390

SUBJECT: Review Plan Approval for New Jersey Back Bays Coastal Storm Risk Management Feasibility Study

1. Reference CENAP-PL-PC memorandum dated 23 June 2016, subject as above.

2. The Coastal Storm Risk Management Planning Center of Expertise of the North Atlantic Division is the lead office to execute the referenced Review Plan. The Review Plan includes Independent External Peer Review.

3. The enclosed Review Plan is approved for execution and is subject to change as study circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to this Review Plan or its execution require new written approval from the NAD Commander.

4. The point of contact is Mr. Larry Cocchieri, NAD Planning Program Manager, at 347-370-4571, or by email to Lawrence.J.Cocchieri@usace.army.mil.

Encl

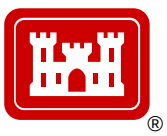
WILLIAM H. GRAHAM
Brigadier General, USA
Commanding

New Jersey Back Bays Coastal Storm Risk Management Feasibility Study

Review Plan

U.S. Army Corps of Engineers

20 August 2016



New Jersey Back Bays
Coastal Storm Risk Management Study

Review Plan

Philadelphia District

MSC Approval Date: Pending
Last Revision Date: 20 August, 2016

Review Plan

New Jersey Back Bays
Coastal Storm Risk Management Study
Project Management Plan

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1.0 Purpose and Requirements

a. Purpose. This Review Plan (RP) defines the scope and level of peer review for the New Jersey Back Bays (NJBB) Coastal Storm Risk Management (CSRM) Study.

b. References

(1) Engineering Circular (EC) 1165-2-214, Civil Works Review Policy, 15 Dec 2012

(2) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011

(3) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006

(4) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007

(5) Project Management Plan (Under Development)

(6) MSC and/or District Quality Management Plan(s)

c. Requirements. This review plan was developed in accordance with EC 165-2-214, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR, Type I and Type II), and Policy and Legal Compliance Review. In addition to these levels of review, decision documents are subject to cost engineering review and certification (per EC 1165-2-214) and planning model certification/approval (per EC 1105-2-412).

2.0 Review Management Organization (RMO) Coordination

a. The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for decision documents is typically either a Planning Center of Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. The RMO for the peer review effort described in this Review Plan is the National Planning Center for Coastal Storm Risk Management (CSRM-PCX).

b. The RMO will coordinate with the Civil Works Cost Engineering and Agency Technical Review (ATR) Mandatory Center of Expertise (MCX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies.

3.0 Study Information

a. Decision Document. The decision document for this project will be a feasibility-level analysis for the NJBB CSRM Study. The analysis will contain the plan formulation, National Environmental Policy Act (NEPA) documentation, and the project's economic justification. This document will be approved at the HQUSACE level.

b. Study/Project Description. As a result of Hurricane Sandy in October 2012, Congress passed PL 113-2, which authorized supplemental appropriations to Federal agencies for expenses related to the consequences of Hurricane Sandy. Chapter 4 of PL 113-2 identifies those actions directed by Congress specific to the U.S. Army Corps of Engineers (USACE), including preparation of two interim reports to Congress, a project performance evaluation report, and a comprehensive study to address the flood risks of vulnerable coastal populations in areas affected by Hurricane Sandy within the boundaries of the North Atlantic Division of the U.S. Army Corps of Engineers (NAD).

The objective of the NJBB CSRM Study is to investigate coastal storm risk management problems and solutions for the NJBB Focus Area to reduce damages from coastal flooding affecting population, critical infrastructure, critical facilities, property, and ecosystems. CSRM strategies and measures will be formulated for potential implementation to support resilient coastal communities and robust, sustainable coastal landscape systems in accordance with the NOAA-USACE Infrastructure Rebuilding Principles (https://coast.noaa.gov/data/digitalcoast/pdf/rebuilding-principles.pdf).

This study aims to determine whether Federal interest exists in proceeding to feasibility phase investigations and to identify a non-Federal sponsor willing to cost-share the feasibility phase in accordance with a Feasibility Cost-Sharing Agreement (FCSA) with the USACE. A Project Management Plan for feasibility phase investigations has been developed separately and this RP will be a component of that Project Management Plan.

Factors Affecting the Scope and Level of Review. The ATR team should focus on the technical analysis, hydrology/hydraulic analysis and development of alternatives to assure quality control in the projects forwarded for Major Subordinate Command (MSC) consideration.

(1) Most aspects of the study will be technically challenging; but similar

measures have been successfully engineered and implemented on similar projects in the area and at other locations around the country.

(2). There is a moderate level of uncertainty associated with this study. The hydraulic/hydrologic and economic analyses performed during the feasibility study will be put through a rigorous peer reviewed Risk and Uncertainty Analysis.

(3) Implementation of a coastal storm risk management project could potentially reduce flood related risks to human life/safety. The overall study will focus on traditional flood coastal storm risk management measures along with comprehensive solutions across multiple disciplines that include relocation, fortification, living shorelines, Natural and Nature Based Infrastructure, beach nourishment, bulkheads, storm surge barriers and hardened structures. Non-performance or design exceedance of these measures may result in risks to life safety. The District Chief of Engineering has not determined that there is a potential for significant life safety risk associated with some of the measures being considered in the event of non-performance or design exceedance.

(4) A peer review by independent experts has not been initiated.

(5) The study is not likely to involve significant public dispute as to the size, nature, or effects of the project. The project delivery team (PDT) will conduct scoping/charette meetings with elected officials, regional partners and resource agencies after the initial stages of the study are complete. Information will be provided to meeting attendees about plan formulation and the results of the initial screening, along with conceptual alternatives.

(6) The study may involve public concern as to the economic or environmental cost or benefit of the project.

(7) The information in the decision document is not likely to be based on novel methods, involve the use of innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting models, or present conclusions that are likely to change prevailing practices.

(8) At this early stage, it is unknown to what degree the project design will require redundancy, resilience, and/or robustness. However, these qualities will be built into the range of storm damage reduction alternatives considered as part of the study.

In-Kind Contributions. Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. No in-kind

products and analyses are to be provided by the non-Federal sponsor at this time. The non-Federal sponsor's cost share is being provided through cash contributions and no in-kind services have been provided.

4.0 District Quality Control (DQC)

a. All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan. The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC.

b. Documentation of DQC. A District Quality Control Review (DQCR) will be conducted on all completed study documents prior to ATR. The ATR team will be provided access to the DQC comments and responses. District quality control documents that review contractor work will be provided to the ATR team through attachment in DrChecks. All future contractor work will be documented and posted in DrChecks. For work conducted in-house, technical supervisors are assuring that experienced personnel, who have been involved with similar work, are checking team members' technical work for completeness, accuracy and clarity. DQC of all in-house work will be documented in DrChecks. At a minimum a comment citing all DQC reviews will be placed in DrChecks that states the review has been performed and all comments have been adequately addressed. Any major comment regarding the documents will also be placed in DrChecks. Comments minor in nature will be provided to the PDT and addressed outside of DrChecks.

5.0 Agency Technical Review (ATR)

a. ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the designated RMO which will be the CSRM-PCX and the North Atlantic Coast Comprehensive Study (NACCS) Command Center. The ATR will be conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead has been identified to be located at the NACCS Command Center. This is an exception to the policy prescribed in EC 1165-2-214 that requires the ATR lead shall be from outside of the home MSC, which has HQUSACE concurrence.

b. Products to Undergo ATR. The feasibility study will be conducted in phases. ATR will occur on the draft feasibility study report presenting the tentatively selected plan and associated NEPA documentation, and final feasibility study report and associated NEPA documentation.

c. Required ATR Team Expertise. The expertise represented on the ATR team reflects the significant expertise involved in the work effort and generally mirrors the expertise on the PDT. The ATR Team Leader will follow the requirements outlined in the "ATR Lead Checklist" developed by the National Planning Centers of Expertise. In addition to the ATR team, the USACE Climate Preparedness and Resilience Community of Practice would be consulted and participate in review of the tentatively selected plan. Further, external peer review from an international subject matter expert would also be consulted and participate in review of the tentatively selected plan. The following table provides a list of disciplines included on the ATR team and descriptions of the expertise required.

Table 1 ATR Team Disciplines and Expertise

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc.).

Plan Formulation	The Planning reviewer should be a senior water resources planner with experience in the formulation aspect of CSRM studies.
Economics	The Economics reviewer should be a senior level economist with experience in evaluating the benefits and costs associated with a CSRM study, including the use of HEC-FDA and BeachFX.
Environmental Resources	The Environmental reviewer should be a senior biologist with experience in ecosystem restoration opportunities associated with CSRM studies, especially tidal wetland enhancement. They should also have expertise in NEPA compliance.
Cultural Resources	The Cultural Resources reviewer should be a senior archaeologist.
Coastal Engineering	The coastal engineering reviewer should be a senior engineer with experience with coastal storm risk management investigations and projects. The coastal engineer should also be an expert in the field of coastal storm modeling, specifically SBEACH, STWAVE, and ADCIRC
Hydrologic Engineering	The Hydrology reviewer should be a senior level hydrologic engineer with experience in CSRM studies and the development of flow and stage frequency curves.
Hydraulic Engineering	The Hydraulic Engineering reviewer should be an expert in the field of hydraulics and have a thorough understanding and knowledge of open channel dynamics, enclosed channel systems, application of detention/retention basins, application of levees and flood walls, interior drainage, nonstructural solutions involving flood warning systems and flood proofing, etc. and/or computer modeling techniques that will be used such as HEC-RAS and HEC-HMS.
Risk Analysis	The risk analysis reviewer will be experienced with performing and presenting risk analyses in accordance with ER 1105-2-101 and other related guidance, including familiarity with how information from the various disciplines involved in the analysis interact and affect the results.
Geotechnical Engineering	The Geotechnical reviewer should be a senior geotechnical engineer familiar with the geotechnical requirements of structural and nonstructural CSRM measures.
Civil Engineering	The Civil Engineering reviewer should be a senior civil engineer familiar with structural and nonstructural CSRM measures.

Cost Engineering	The Cost Engineering reviewer should be a senior cost engineer. This position may need to be filled by a Cost Engineer from the MCX.
Real Estate	The Real Estate representative should be an expert in real estate acquisition and appraisals.

a. Documentation of ATR. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

(1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;

(2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;

(3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and

(4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any Vertical Team coordination (the Vertical Team includes the District, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the Vertical Team for further resolution in accordance with the policy issue resolution process described in either ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the Vertical Team for resolution.

At the conclusion of each ATR review, the ATR Team Leader will prepare a Review Report summarizing the review. Review Reports will be considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

ATR may be certified when all ATR concerns are either resolved or referred to the Vertical Team for resolution and the ATR documentation is complete. The RMO will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the Vertical Team). A Statement of Technical Review should be completed, based on work reviewed to date, for the AFB, draft report, and final report. A sample Statement of Technical Review is included in Attachment 2.

6.0 Independent External Peer Review (IEPR)

a. IEPR may be required for decision documents under certain circumstances. 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 USACE is warranted. A risk-informed decision, as described in EC 1165-2-214, is made as to whether IEPR is appropriate. IEPR panels typically consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

(1) Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project studies and decision documents. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-214.

(2) Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and CSRM projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction implementation documents prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health, safety and welfare. In some cases Type II SAR are conducted on decision documents prior to full design and construction.

b. Decision on IEPR. Application of an IEPR requires a risk informed decision considering the following factors (Appendix D of EC 1165-2-214):

(1) The consequences of nonperformance on project economics, the environment, and social well-being (public safety and social justice).

(2) Whether the product is likely to contain influential scientific information or be highly influential scientific assessment.

(3) If and how the study meets any of the possible IEPR exclusions described in Paragraph 11.d. (3) and Appendix D of EC 1165-2-214.

c. IEPR Exclusion. This study does not meet the all of the IEPR exclusion criteria. Because of the potential risks associated with the study, Type I IEPR is recommended for this project. This study will be subject to Type I IEPR on the basis of potential life safety risks. The general purpose of the IEPR is to consider the adequacy, appropriateness, and acceptability of the design in assuring public health, safety, and welfare. While a Type II IEPR - Safety Assurance Review (SAR) is anticipated to be required on project design and implementation document a Type – II SAR will also be performed on Type I IEPR decision documents for the feasibility analysis.

d. Products to Undergo Type I IEPR. Type I IEPR should be performed for the entire decision document (including supporting documentation) at the draft report stage. The IEPR should be coordinated in the beginning phase of the study. Safety Assurance will be addressed during the Type I IEPR.

e. Required Type I IEPR Panel Expertise. Type I IEPR will be conducted for this study. The expertise represented on the IEPR panel should be similar to those on the ATR team. The panel will include the necessary expertise to assess the engineering, environmental, and economic adequacy of the decision document as required by EC 1165-2-214, Appendix D.

Table 2 IEPR Team and Expertise

IEPR Panel Members/Disciplines	Expertise Required
Plan Formulation	The Panel Member should be from academia, a public agency, a non-governmental entity, or an Architect-Engineer or Consulting Firm with a minimum of 10 years demonstrated experience in public works planning with a Master's Degree in a relevant field. Direct experience working for or with USACE is highly preferred but not required. The panel member shall have a minimum of five years' experience directly dealing with the USACE six-step planning process, which is governed by ER 1105-2-100, Planning Guidance Notebook. Panel Member must be very familiar with USACE plan formulation process, procedures, and standards as it relates to hurricane and coastal storm risk management projects.
Economics	The panel member should be from academia, a public agency, a non-governmental entity, or an Architect-Engineer or Consulting Firm with a minimum of 10 years demonstrated experience in public works planning, with a minimum MS degree or higher in economics. Five years' experience related to the use of HEC-FDA software is required. Familiarity with BeachFX software is desired. Two years' experience in reviewing federal water resource economic documents justifying construction efforts is required. In addition, the panel member should have experience related to regional economic development, and be capable of evaluating traditional National Economic Development plan benefits associated with hurricane and coastal storm risk management projects.
Biology/Ecology,	The Environmental reviewer will be responsible for assessing The panel member should be a scientist from academia, a public agency, a non-governmental entity, or an Architect-Engineer or Consulting Firm with a minimum 10 years demonstrated experience in evaluation and conducting National Environmental Policy Act (NEPA) impact assessments, including cumulative effects analyses. The panel member should also be familiar with all NEPA Environmental Assessment requirements as well as have experience with the Endangered Species Act, essential fish habitat, and the Marine Mammals Protection Act. The panel member should have particular knowledge of construction impacts on marine and terrestrial ecology of coastal regions of the mid-Atlantic coast of North America. The panel member should have a minimum of a Master's Degree or

IEPR Panel Members/Disciplines	Expertise Required
	higher in an appropriate field of study. Active participation in related professional societies is encouraged.
Coastal Engineering	The panel member should be a registered professional engineer with a minimum of 10 years' experience in coastal and hydraulic engineering, or a professor from academia with extensive background in coastal processes and hydraulic theory and practice, with a minimum Master's Degree or higher in engineering. Active participation in related professional societies is encouraged. The panel member should be familiar with USACE application of risk and uncertainty analyses in hurricane and coastal storm risk management projects. The panel member should also be familiar with standard USACE coastal, hydrologic, hydraulic computer models. In addition, familiarity with the SBEACH, GENESIS, STWAVE, and ADCIRC computer applications/model is desired. The panel member should be capable of addressing the USACE Safety Assurance Review (SAR) requirements.
Geotechnical Engineering	The Panel Member should be a registered professional engineer having a minimum of 10 years' experience in geotechnical engineering with a Master's Degree or higher in engineering. The Panel Member should have demonstrated experience in foundation investigations for various management measures associated with hurricane and coastal storm risk management, or related projects, including natural and nature based features. The reviewer should have extensive experience in geotechnical evaluation of static and dynamic slope stability evaluation, evaluation of the seepage through earthen embankments and underseepage through the foundation of the flood risk management structures, including canal and levee embankments, floodwalls, closure structures and other pertinent features, and in settlement evaluation of the structure. Familiarity with practices used in flood/coastal storm risk management in the mid-Atlantic coast of North America is preferred but not required. The panel member also should have experience related to cost engineering/construction management for hurricane and coastal storm damage risk management. The panel member should be capable of addressing the USACE SAR requirements.
Civil Engineering	The panel member should be a registered professional engineer with a minimum of 10 years' experience in civil

IEPR Panel Members/Disciplines	Expertise Required
	engineering with an emphasis on design of large civil works projects as well as non-structural flood risk management measures, or a professor from academia with extensive background in coastal processes, with a minimum of MS degree or higher in engineering. The reviewer should have familiarity with USACE standards that the quantities estimated and assumptions are reasonable to derive accurate cost estimates. Active participation in related professional societies is encouraged.

f. Documentation of Type I IEPR. The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO) per EC 1165-2-214, Appendix D. Panel comments will be compiled by the OEO and should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. IEPR comments should generally include the same four key parts as described for ATR comments in Section 4.d. The OEO will prepare a final Review Report that will accompany the publication of the final decision document and shall:

(1) Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;

(2) Include the charge to the reviewers;

(3) Describe the nature of their review and their findings and conclusions; and

(4) Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

g. The final Review Report will be submitted by the OEO no later than 60 days following the close of the public comment period for the draft decision document. USACE shall consider all recommendations contained in the Review Report and prepare a written response for all recommendations adopted or not adopted. The final decision document will summarize the Review Report and USACE response. The Review Report and USACE response will be made available to the public, including through electronic means on the internet.

7.0 Policy and Legal Compliance Review

All decision documents will be reviewed throughout the study process for their

compliance with law and policy. Guidance for policy and legal compliance reviews is addressed in Appendix H, ER 1105-2-100. These reviews culminate in determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander.

DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods and the presentation of findings in decision documents.

8.0 Cost Engineering and ATR Mandatory Center of Expertise (MCX) Review

All decision documents shall be coordinated with the Cost Engineering MCX, located in the Walla Walla District. The MCX will assist in determining the expertise needed on the ATR team and in the development of the review charge(s), and the MCX will also provide the Cost Engineering certification. The RMO is responsible for coordination with the Cost Engineering MCX.

9.0 Model Certification and Approval

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models, for the purposes of the EC, are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on USACE studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

a. Planning Models. The following planning models are anticipated to be used in the development of the decision document:

Table 3 Certified Planning Models

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
Beach-fx, version 1.1.6	Beach-fx is a new analytical framework for evaluating the physical performance and economic benefits and costs of shore stabilization projects, particularly, beach nourishment along sandy shores. Beach-fx has been implemented as an event-based Monte Carlo life cycle simulation tool that is run on desktop computers.	Certified
HEC-FDA, version 1.4	HEC-FDA will be used to calculate flood damages associated with residential and non-residential structures, their contents, and vehicles. HEC-FDA performs an integrated hydraulic engineering and economic analysis during the formulation and evaluation of flood risk management alternative plans (EM 1110-2-1619, ER 1105-2-101).	Certified
SLAMM	SLAMM assists in the simulation of the dominant processes involved in wetland conversions and shoreline modifications during long-term sea level rise. SLAMM can be used to identify potential improvements for coastal wetlands including assessing the effects of thin-layer placement of dredged materials as a potential mitigation option to reduce wetland losses due to sea level rise,	Not certified; ECO-PCX approval needed for single use as COTS software after Alternative Milestone Meeting.
Habitat Evaluation Procedure	HEP will be used to document the quality and quantity of available habitat for selected species. HEP provides information for two general types of habitat comparisons: 1) the relative value of different areas at the same point in time; and 2) the relative value of the same area at future points in time. By combining the two type of comparisons, the impact/or restoration benefits of the proposed land/water use changes on habitat can be quantified.	Certified

b. Engineering Models. The following engineering models may be used in the development of the decision document:

Table 4 Certified Engineering Models

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
MII	MII is the second generation of the Micro-Computer Aided Cost Estimating System. It is a detailed cost estimating software application.	Cost Engineering Approved
Crystal Ball	Per ECB No. 2007-17, cost risk analysis methods will be used for the development of contingency for the total project cost estimate. Crystal Ball software is approved for use to conduct the total project cost and schedule risk analysis	Cost Engineering Approved
ADCIRC	System of computer programs used for prediction of storm surge and flooding.	EN CoP Approved
STWAVE	Steady state spectral WAVE, half-plane model for nearshore wind-wave growth and propagation	EN CoP Approved

10.0 Review Schedules and Costs

A preliminary project schedule is shown in the table below**.**

Activity/Milestone	Date
Execute FCSA	April 2016
PMP Approval	July 2016
Alternatives Milestone	December 2016
Tentatively Selected Plan Milestone	October 2017
Agency Decision Milestone	May 2018
Signed Chief's Report	April 2019

a. ATR Schedule and Cost. The ATR Team will be part of the integrated study team and ATR will be an ongoing process. The ATR Team will be involved in the Planning SMART process and will be informed/involved in all milestones. Invitations will be forwarded for all Charrettes, In-Progress Review (IPR) meetings and other critical meetings.

The total ATR budget is estimated at $142,600 at this time.
For each ATR review, the following schedule will be adhered to: 2 weeks for the ATR team to provide comments, 2 weeks for the PDT to coordinate and provide responses, and 2 weeks for back check and close-out of the ATR.

b. Type I IEPR Scope and Cost. IEPR will be performed for the entire decision document. It is anticipated that the review will not exceed 12 weeks. Total estimated costs (including IEPR contract, PDT comment response labor, IWR contracting office processing, and PCX management) for the IEPR is $160,000.

c. Model Certification/Approval Schedule and Cost. The models anticipated to be used are already certified or approved for use. Coordination with the appropriate PCX or the RMC for the model(s) in question will be conducted during to study and costs will be deferred at that time.

11.0 Public Participation

a. A scoping meeting will be held early in the process to be consistent with the National Environmental Policy Act (NEPA). Once completed, the Environmental Assessment 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: final decision document, and associated review reports. A State and Agency review will also be performed at the final report milestone.

b. The nomination of peer reviewers will not be considered by recommendations from the public, including scientific or professional societies. Peer reviewers will be selected by the RMO.

12.0 Review Plan Approval and Updates

The North Atlantic Division Commander is responsible for approving this Review Plan. The Commander's approval reflects Vertical Team input (involving District, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the Project Management Plan, the Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval are documented in Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval

memorandum, should be posted on the Home District's, the RMO's, and home MSC's respective websites.

13.0 Review Plan Points of Contact

Public questions and/or comments on this review plan can be directed to the following points of contact:

- Philadelphia District, Project Manager, 215-656-6579
- MSC: North Atlantic Division, 347-370-4566
- Review Management Organization: Coastal Storm Risk Management Planning Center of Expertise, 347-370-4550.

Attachment E-1: Team Rosters

PDT			
Discipline	**Name**	**Phone**	**Email**
Project Manager	J. Bailey Smith		
Plan Formulation	Brian Bogle		
Plan Formulation	Jeff Gebert		
Environmental	Mark Eberle		
Economics	Bob Selsor		
Economics	Micah Kirkpatrick		
Cultural Resources	Nikki Minnichbach		
GIS	Steve Long		
GIS	Erik Karlkvist		
Design Manager	Chip DePrefontaine		
Hydrology & Hydraulics	Randy Wise		
Geotechnical	Travis Fatzinger		
Civil	Mary Pakan		
Cost Engineer	Bill Welk		
Real Estate	Heather Sachs		
Operations	Ryan Moore		
Construction	Christine Clapp		
PPMD	Frank Master		
Resource Management	Steve Morgan		
Contracting	Michelle Bertoline		

PAO	Steve Rochette	[redacted]	[redacted]
CENAN/Plan Formulation	Donald Cresitello	[redacted]	[redacted]
CENAN/Plan Formulation	Danielle Tommaso	[redacted]	[redacted]
NAD POC	Hank Gruber	[redacted]	[redacted]
NAD Command Center	Dave Robbins	[redacted]	[redacted]
NJDEP	Megan Rutkowski	[redacted]	[redacted]

ATR Team (The ATR Team will be selected prior to the scheduled start of the ATR)			
Discipline	**Name**	**Phone**	**Email**
ATR Lead	David Robbins		
Planner	TBD		
Economics	TBD		
Environmental	TBD		
Hydrology & Hydraulics	TBD		
Risk Analysis	TBD		
Geotechnical	TBD		
Civil Engineering	TBD		
Real Estate	TBD		
Cost Engineering	TBD		
Cultural Resources	TBD		

IEPR Team			
Discipline	**Name**	**Phone**	**Email**
IEPR Lead	Anastasiya Hernandez		
IEPR Lead	pending	pending	pending
Planner	pending	pending	pending
Economics	pending	pending	pending
Coastal Engineering	pending	pending	pending
Biologist	pending	pending	pending
Geotechnical/Civil	pending	pending	pending

Attachment E- 2: Sample Statement of Technical Review for Decision Documents

Completion of Agency Technical Review

The Agency Technical Review (ATR) has been completed for the New Jersey Back Bays (NJBB)
Coastal Storm Risk Management (CSRM) Study. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-214. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks[sm].

SIGNATURE _____ _____

Name Date
ATR Team Leader
Office Symbol/Company

SIGNATURE _____ _____

Name Date
Project Manager
Office Symbol

SIGNATURE _____ _____

Name Date
Architect Engineer Project Manager[1]
Company, location

SIGNATURE _____ _____

Name Date
Review Management Office
Representative
Office Symbol

Certification of Agency Technical Review

Significant concerns and the explanation of the resolution are as follows:
Describe the major technical concerns and their resolution.

As noted above, all concerns resulting from the ATR of the project have been fully resolved.

SIGNATURE _____ _____

Name Date
Chief, Engineering Division
Office Symbol

SIGNATURE _____ _____

Name Date
Chief, Planning Division
Office Symbol

[1] Only needed if some portion of the ATR was contracted

Attachment E-3: Review Plan Revisions

Revision Date	Description of Change	Page / Paragraph Number
TBD	Peer Review Plan-Initial	

Attachment E- 4: Acronyms and Abbreviations

Term	Definition	Term	Definition
		MSC	Major Subordinate Command
ASA(CW)	Assistant Secretary of the Army for Civil Works	NED	National Economic Development
ATR	Agency Technical Review	NER	National Ecosystem Restoration
CSRM	Coastal Storm Risk Management	NEPA	National Environmental Policy Act
DPR	Detailed Project Report	OMB	Office and Management and Budget
DQC	District Quality Control/Quality Assurance	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
EA	Environmental Assessment	OEO	Outside Eligible Organization
EC	Engineer Circular	OSE	Other Social Effects
EIS	Environmental Impact Statement	PCX	Planning Center of Expertise
EO	Executive Order	PDT	Project Delivery Team
		PL	Public Law
FEMA	Federal Emergency Management Agency	QMP	Quality Management Plan
FRM	Flood Risk Management	QA	Quality Assurance
		QC	Quality Control
		RED	Regional Economic Development
Home District/MSC	The District or MSC responsible for the preparation of the decision document	RMC	Risk Management Center
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMO	Review Management Organization
IEPR	Independent External Peer Review		
		SAR	Safety Assurance Review
		USACE	U.S. Army Corps of Engineers
MCX	Mandatory Center of Expertise	WRDA	Water Resources Development Act