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U.S. ARMY CORPS OF ENGINEERS, NORTH ATLANTIC DIVISION  
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CENAD-PD-P

AUG 14 2014

MEMORANDUM FOR Commander, New England District, (CENAE-EP-PS/Chris Hatfield) 696 Virginia Road Concord, MA 01742-2751

SUBJECT: Review Plan Approval for Pawcatuck River, Rhode Island Coastal Storm Damage Reduction Feasibility Report

1. Reference, Pawcatuck River, Rhode Island Coastal Storm Damage Reduction Feasibility Report Review Plan prepared by New England District dated June 2014.
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 above referenced Review Plan has been 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 will require new written approval from this office.
4. Point of contact is Mr. Larry Cocchieri, 347-370-4571.

Encl  
Review Plan, Pawcatuck River,  
Rhode Island Coastal

  
KENT D. SAVRE  
Brigadier General, USA  
Commanding

# **REVIEW PLAN**

**Pawcatuck River, Rhode Island  
Coastal Storm Damage Reduction Feasibility Report**

**New England District**

**MSC Approval Date: August 14, 2014  
Last Revision Date: June 2014**



**US Army Corps  
of Engineers®**

# REVIEW PLAN

## Pawcatuck River, Rhode Island Coastal Storm Damage Reduction Feasibility Report

### TABLE OF CONTENTS

1. PURPOSE AND REQUIREMENTS .....	3
2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION .....	3
4. DISTRICT QUALITY CONTROL (DQC) .....	7
5. AGENCY TECHNICAL REVIEW (ATR) .....	8
6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR) .....	11
7. POLICY AND LEGAL COMPLIANCE REVIEW .....	15
8. COST ENGINEERING AND ATR MANDATORY CENTER OF EXPERTISE (MCX) REVIEW AND CERTIFICATION .....	15
9. MODEL CERTIFICATION AND APPROVAL .....	15
10. REVIEW SCHEDULES AND COSTS .....	17
11. PUBLIC PARTICIPATION .....	17
12. REVIEW PLAN APPROVAL AND UPDATES .....	18
13. REVIEW PLAN POINTS OF CONTACT .....	18
ATTACHMENT 1: TEAM ROSTERS .....	19
ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS .....	21
ATTACHMENT 3: REVIEW PLAN REVISIONS .....	23
ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS .....	24

## 1. PURPOSE AND REQUIREMENTS

**a. Purpose.** This Review Plan defines the scope and level of peer review for the Pawcatuck River, Rhode Island Coastal Storm Damage Reduction (CSDR) Feasibility Report and National Environmental Policy Act (NEPA) Compliance Report.

### **b. References.**

- (1) Engineering Circular (EC) 1165-2-214, Civil Works Review, 15 Dec 12
- (2) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 11
- (3) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 06
- (4) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 07
- (5) Project Management Plan for the Pawcatuck River, Rhode Island Flood Risk Management Feasibility Study and National Environmental Policy Act (NEPA) Compliance Report
- (6) New England District Quality Management Plan(s)

**c. Requirements.** This review plan was developed in accordance with EC 1165-2-214, 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), 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. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

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 Coastal Storm Risk Management Planning Center of Expertise.

The RMO will coordinate with the Civil Works Cost Engineering and Agency Technical Review 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. The District will coordinate with the Ecosystem Restoration Center of Expertise should a worthy ecosystem restoration be identified during the study.

### 3. STUDY INFORMATION

**a. Decision Document.** This study is authorized in a resolution approved by the Committee on Public Works of the United States Senate, dated September 12, 1969 (also known as the Southeastern New England (SENE) resolution). This resolution by the Committee on Public Works of the United States Senate gives the Army Corps of Engineers the authority to investigate solutions for "flood control, navigation, and related purposes in Southeastern New England ..." Authorization and funding is also provided under investigations heading, Chapter 4, Title X, Division A of the Disaster Relief Appropriations Act of 2013, Public Law 113-2 (127 Stat. 23) enacted January 29, 2013 (hereinafter "DRAA 13"). The Secretary of the Army is authorized, at full Federal expense using funds provided in DRAA 13, to complete ongoing flood and storm damage reduction studies in areas that were impacted by Hurricane Sandy in the North Atlantic Division of the United States Army Corps of Engineers, which includes the Pawcatuck River CSDR Feasibility Study. The District will prepare the Pawcatuck River CSDR Feasibility Study and NEPA Compliance decision document for review by the North Atlantic Division (NAD) and approval at Corps Headquarters in Washington. The decision document is expected to result in a Chief of Engineers Report and a Director's Report for the on-going Feasibility Study. The Director's Report would be for the initial construction of the recommended plan, for approval by the Director of Civil Works, Assistant Secretary of the Army. The Chief's Report would address the periodic nourishment of the recommended plan and would need to be approved by the Chief of Engineers and then provided to the U.S. Congress for authorization. It is expected that the Environmental Assessment (EA) will result in the signing of a Finding of No Significant Impact (FONSI) at the District level.

**b. Study/Project Description.** In 2013 the USACE New England District conducted a focus area analysis or "reconnaissance-like" investigation as part of the North Atlantic Coastal Comprehensive Study under the authority of P.L. 113-2. That investigation concluded that there is a Federal interest in continuing with a feasibility study. The study area is located entirely in Washington County, Rhode Island (Figure 1) and includes portions of the towns of Westerly, Charlestown, South Kingstown and Narragansett. The coastal area is about 24 miles in length.

The arrival of Hurricane Sandy on October 29, 2012 was preceded by Coastal Flood Warnings and mandatory evacuations for coastal towns, low lying areas and mobile homes. The storm surge destroyed houses and businesses, damaged pilings and deck supports, blew out walls on lower levels, and moved significant amounts of sand and debris into homes, businesses, streets, and adjacent coastal ponds. Propane gas tanks were dislodged from houses, septic systems were damaged and underground septic tanks were exposed, creating potential hazardous material exposure. The National Guard was called out to restrict entry to the community of Misquamicut (located in the town of Westerly) due to the devastation. More than

\$39.4 million in support from four federal disaster relief programs was used to assist Rhode Island recover from Hurricane Sandy's effects.

The feasibility study will evaluate alternatives and recommend a plan to reduce the economic and life risk for areas affected by coastal storm damage in the Pawcatuck River watershed. Alternatives considered will include no action, and structural and non-structural measures. The planning objectives for the feasibility study are to

- Developing projects that are resilient in light of future climate change and sea level rise.
- Protecting and restoring natural ecosystems and the environment while encouraging sustainable economic development;
- Avoiding adverse impacts to natural ecosystems wherever possible and fully mitigating any unavoidable impacts; and
- Avoiding the inappropriate use of flood plains, flood-prone areas and other ecologically valuable areas.

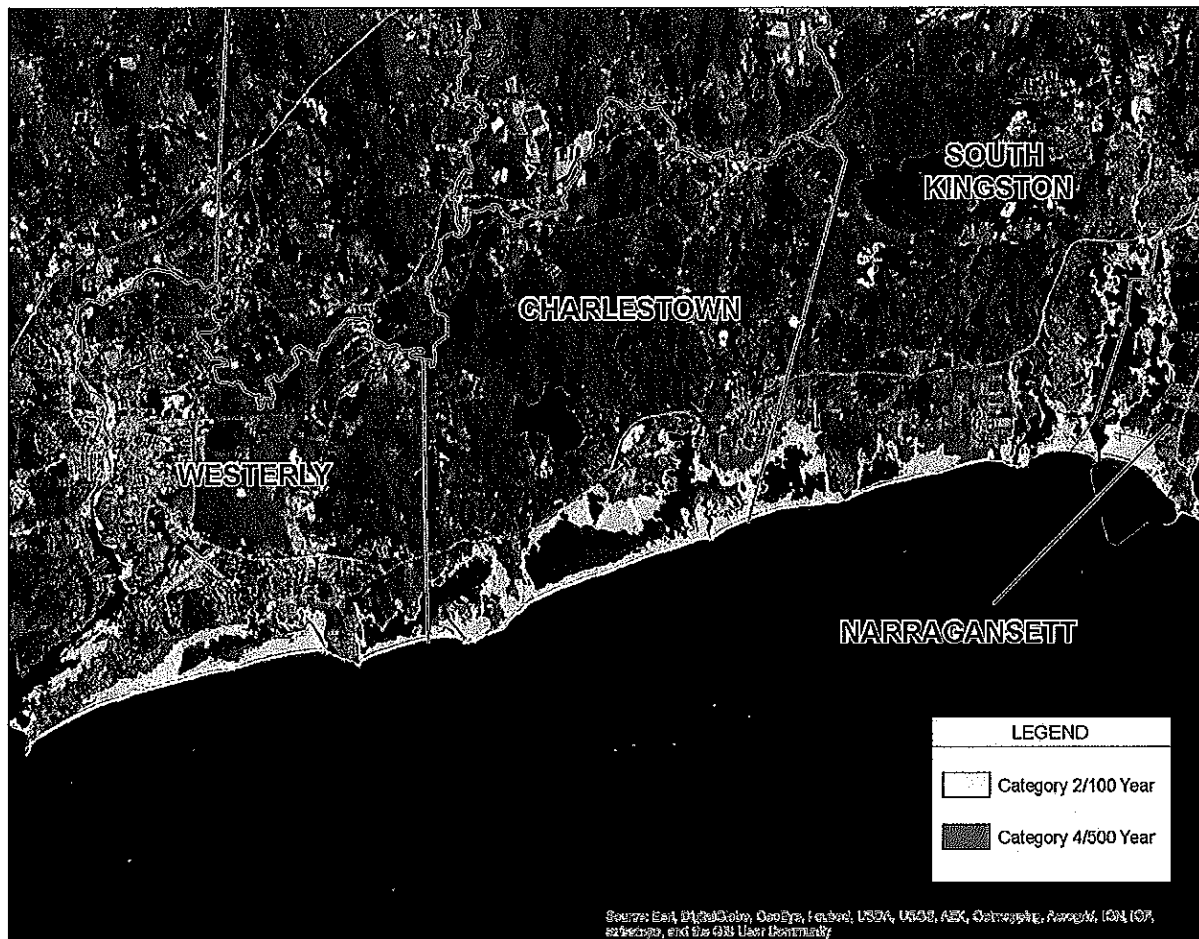


Figure 1. Pawcatuck River Coastal Watershed with Hurricane Storm Surge Mapping Overlain

**c. Factors Affecting the Scope and Level of Review.**

The complexity, challenges, and risks associated with the Pawcatuck River CSDR Feasibility Study will depend on the size of the affected area eligible for Federal participation and the probable alternatives formulated. We anticipate that an IEPR of our Decision Document is necessary at this point in the project. The Project Delivery Team (PDT) and Vertical Team (VT) will evaluate risks associated with each alternative throughout the project. The PDT and VT will make a decision on whether an IEPR is required during the Alternatives Milestone and again during Tentatively Selected Plan Milestones. We assume a Type I IEPR is required at this stage and is included in the project schedule and budget.

Challenges associated with this CSDR study include defining the scope and extent of the study. The coastline is 24 miles long and storm damage impacts are broad, but impacts severe enough to warrant Federal participation may be limited. The PDT will need to accurately define the study area and appropriate alternatives for Federal participation. An accurate assessment of the economics of potential damages will be challenging. There are many secondary impacts when infrastructure is impacted due to a storm event and can be difficult to quantify. There is also the potential for various stakeholders (e.g. fishing and recreational interests, environmental resource agencies, etc..) to oppose structural measures if recommended including the use of offshore sand sources.

The project will not be justified by life safety. The project is also unlikely to involve significant threat to human life, but our study will evaluate this risk throughout the process. The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) office in Taunton, Massachusetts provides daily coastal storm forecasts and warnings to local communities and businesses. Project stakeholders are aware of the NWS systems and use warnings to prepare for an event. During an extreme coastal event it is anticipated that employees at businesses and residents evacuate quickly and safely to higher ground. Residents are less likely to evacuate, but flooding conditions are generally limited to the immediate coast line. Residents experience a temporary inconvenience of restricted road travel and power outages.

Hurricane Sandy made landfall on the evening of the October 29, 2012 as a "post-tropical cyclone" near Atlantic City, NJ with winds of 90 mph. Sandy caused extensive flooding, beach erosion and coastal damage along the shorelines from Delaware north to Rhode Island. The surge height from Sandy in southern New England increased from east to west, with the maximum surge occurring in western Long Island Sound. The maximum measured surge in southern New England occurred at the Bridgeport, CT NOAA station and was 9.63 feet with a return period of 275 years. The New London, CT NOAA tide station (closest to the study area) recorded a surge of 6.5 feet, and a surge return period of 64 years. For New

London, the maximum water level return period (surge combined with tide) was 73 years with an elevation of 6.08 feet-NAVD88. Despite the severity of the storm no deaths were reported in the study area.

There has been no request from the Governor of Rhode Island for a study peer review by independent experts. Based on public outreach meetings conducted to date, the feasibility study is not likely to involve significant public dispute as to the size, nature, or effects of the project. CSDR alternatives will be developed in full consideration of the comments provided to the PDT from project stakeholders. The affected towns and the State of Rhode Island are represented on the PDT and local and State officials are very supportive of the study.

The information presented in the decision document will not be based on novel methods or involve the use of innovative materials or techniques. The overall study has limited risks and will most likely be a very traditional CSDR projects. The study is considering both structural and non-structural measures including relocation, beach fill projects, elevating structures or utilities, flood proofing, and small protective floodwalls or revetments. The PDT does not believe the study will present complex challenges for interpretation or require the need for precedent-setting methods or models. Only accepted planning and engineering models will be used for this study. Based on the traditional nature of this study, conclusions presented in the decision document are unlikely to change prevailing practices.

At this early stage, it is unknown to what degree the project design will require redundancy, resiliency, and/or robustness. However, these qualities will be built into the range of CSDR alternatives considered as part of the study.

The factors affecting the scope and level of review will be reassessed and the review plan will be updated at least three times; when the without-project conditions are identified; when the array of alternatives to be considered are identified; and when the preferred alternative is identified. These updates are especially important to validate the initial assessment that the project will not pose a significant threat to human life.

**d. In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. We do not anticipate the non-Federal sponsor providing any in-kind products or analyses at this time.

#### **4. DISTRICT QUALITY CONTROL (DQC)**

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 (PMP). 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.

**Documentation of DQC.** Documentation of the technical and policy review of a specific product will be sufficient to allow both planning management and QC reviewers to feel confident that a comprehensive review was conducted in accordance with principles and guidelines established. It is expected that all in-progress review actions, review team meetings, and other significant technical review related actions will be documented in the form of a written memorandum prepared by the review leader. This memorandum will be provided to the ATR team to inform them that the internal DQC review has been completed by the New England District.

**5. AGENCY TECHNICAL REVIEW (ATR)**

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 and is 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 will be from outside the home MSC.

a. **Products to Undergo ATR.** Specific products to undergo ATR include the Draft and Final Report (including NEPA and supporting documentation). Documents prepared prior to the draft report will be made available to the ATR team upon request (e.g. Alternative Milestone and Tentatively Selected Plan Milestone documentation). NAE does not anticipate the ATR team will request to review the alternative and TSP milestone documentation, but the information will be provided with the Draft Report if requested.

b. **Required ATR Team Expertise.**

<b>ATR Team Members/Disciplines</b>	<b>Expertise Required</b>
ATR/ Planning Lead	The ATR lead should be a senior water resources planner with extensive experience in preparing CSDR Civil Works decision documents and conducting ATRs. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead will serve as a reviewer for the plan formulation component of the study.

Economics	The team member for the economics portion of the ATR review will have knowledge of damage evaluation for CSDR studies, stage damage curve assessments, structure evaluation, stage damage curve assessments HEC's Expected Annual Flood Damage methodology, and BeachFx.
Environmental Resources	The team member for the environmental section should be an expert in the NEPA process, reviewing EAs, Fish & Wildlife Impacts, Coastal Zone Management and the Section 7 of Endangered Species Act, Sections 401 and 404 of the Clean Water Act, the Clean Air Act, the U.S. Fish and Wildlife Coordination Act, and Section 106 of the National Historic Preservation Act. The reviewer should also be familiar with cultural resources.
Hydrology & Hydraulic Engineering	The H&H engineering reviewer will be an expert in the field of hydrology and hydraulics and have a thorough understanding of coastal processes, beach fill projects, coastal structures, non-structural solutions involving relocation and elevating structures, Beach Fx modeling as well as other coastal models (e.g. CWS, ST-Wave, AD-CIRC, etc.)
Civil/Gen Engineering	The person performing the review for the civil engineering portions of this study should have a good understanding of typical USACE FRM structural project designs such as beach berms, revetments, floodwalls and integrated pump systems. The reviewer should also be familiar with dredging and the mechanical and electrical pump feasibility-level design fundamentals.
Geotechnical Engineer	The geotechnical reviewer should be a senior geotechnical engineer familiar with geologic principles, static and dynamic slope stability evaluation, evaluation of the seepage through earthen embankments and under seepage through the foundation of the structures, floodwalls, closure structures and other pertinent features, and in settlement evaluation of the structure. The reviewer should also have knowledge of boring logs, soil sampling techniques and testing methods for both geotechnical and environmental testing.
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.
HTRW (Tentative)	This team member will be familiar with HTRW Site Inspection Reports, hazards mapping, soil sampling and environmental testing, groundwater monitoring, and groundwater testing.
Cost Engineering	The team member reviewing the cost engineering section of the report should have familiarity with cost estimates that have been developed in accordance with the guidance contained in ER 1110-2- 1302, Civil Works Cost Engineering using the MII (MCACES Second Generation) cost estimating system. Cost estimates will be prepared for all items that are required for project construction for both Federal and non-Federal costs, including mitigation, operation and maintenance. The Cost Engineering review will be coordinated with the Cost Engineering Center of expertise at the Walla Walla District.
Real Estate	The real estate reviewer should be an expert in real estate acquisition, appraisals, temporary work area easements and real estate mapping.

**c. 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 VT coordination (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 effort, the ATR team 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.

**d. Certification of ATR.** ATR is certified when all ATR concerns are either resolved or referred to the VT for resolution and the ATR documentation is complete. The ATR Lead 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 including the draft report and final report. A sample Statement of Technical Review is included in Attachment 2.

## **6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)**

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 to determine if IEPR is appropriate for this project and is described below. IEPR panels will 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. 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 flood risk management 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 activities 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.

**a. Decision on IEPR.** Based on the guidance published in EC 1165-2-214 and the lack of information to justify exclusion at this point in the project process, the Pawcatuck CSDR study is expected to undergo a Type I IEPR including a Safety Assurance Review. Although the existing flooding conditions do not appear to involve significant threat to human life, we have not performed any analysis in enough detail to conclude that future conditions would not increase this risk. However, this project does not trigger any of the other mandatory triggers for Type I IEPR including:

- Total Project Costs – the Focus Area analysis estimated the CSDR alternative for the Misquamicut Beach area to be \$26 million, still below the \$45 million threshold;
- The State Governor has not requested a review;
- The Chief of Engineers or the Director of Civil Works (DCW) have not determined that the project study is controversial in size, nature, effects, economics, environmental, costs or estimated benefits;
- The head of a Federal or state agency has not determined that the project is likely to have a significant adverse impact on environmental, cultural, or other resources after implementation of planned mitigation;
- The information reviewed and generated during the study is not based on novel methods, doesn't present complex challenges for interpretation, does not contain precedent-setting method or models and is not likely to present conclusions that are likely to change prevailing practices.

A project study may be excluded from Type I IEPR in cases where none of the above mandatory triggers are met and:

- The project does not include an EIS,
- The DCW or the Chief determines that the project is not controversial and has no more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources or substantial adverse impacts on fish and wildlife species and endangered or threatened species under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) or the critical habitat.

The project is expected to contain an Environmental Assessment (EA) and a Finding of No Significant Impact (FONSI). It is the PDT's opinion at this stage that the project will have no adverse effects on the tribal, cultural or historic areas or any adverse effects on Endangered Species based information gathered during the reconnaissance study. The PDT and the VT will continue to evaluate the need for Type I and Type II IEPR throughout the study.

**a. Products to Undergo Type I IEPR.** The Draft Integrated Coastal Storm Damage Reduction Feasibility and Environmental Assessment Decision Document, including supporting documentation will undergo IEPR. All products will be reviewed by the PDT and undergo DQC and ATR prior to submittal for IEPR. This includes products that are produced by the non-Federal sponsors as in-kind services, though the PDT does not anticipate the sponsor producing any in-kind services at this time.

**b. Required Type I IEPR Panel Expertise.** IEPR will be conducted by a minimum of three IEPR team members. Disciplines that are anticipated to undergo IEPR are coastal hydraulics and engineering, geotechnical engineering, civil design, economics, and environmental impacts.

IEPR Panel Members/Disciplines	Expertise Required
Plan Formulation	The Plan Formulation reviewer should be a senior water resources planner with experience in CSDR and environmental mitigation methods.
Economics	The Economics reviewer will be responsible for reviewing the required economic analyses, project benefits, anticipated future costs, and residual damages for the project alternatives. The Economics reviewer should have extensive experience in economics analysis for CSDR feasibility studies and utilization of approved economic models (Beach Fx, HEC-FDA and IWR-Plan).
Environmental/Biologist/NEPA	The Environmental reviewer will be responsible for assessing environmental impacts, and ensuring the proper NEPA and cultural resource compliance

	activities were completed. This includes verifying any NER calculations, mitigation plan review, and completion of the Fish and Wildlife Service Coordination Act requirements.
Coastal Hydraulics & Engineering	The coastal hydraulics and engineering reviewer will be an expert in the field of coastal processes and modeling and have a thorough understanding of computer modeling techniques that will be used such as Beach Fx and HEC-FDA.
Geotechnical Engineering	The geotechnical reviewer will ensure that the project designs meet Corps standards, that the quantities estimated and assumptions are reasonable.

**c. 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 described above. The OEO will prepare a final Review Report that will accompany the publication of the final decision document and shall:

- 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; 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.

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.

Reviews of the interim products will be documented in interim Review Reports using the same format as presented above for the final Review Report. The interim Review Reports will be incorporated into the final Review Report.

**d. Type II IEPR/Safety Assurance Review (SAR).** The Pawcatuck River CSDR design and construction activities may be required to undergo Type II IEPR. EC 1165-2-214 requires that a Type II IEPR/SAR be performed on projects that involve a

significant threat to human life and public safety. The PDT and VT will assess the need for a Type II IEPR at the TSP. Details for the Type II IEPR will be determined at that time.

## **7. 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. COST ENGINEERING AND ATR MANDATORY CENTER OF EXPERTISE (MCX) REVIEW AND CERTIFICATION**

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

## **9. 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 Corps 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.** HEC-FDA and BEACH-fx are the only planning models identified at this point that may be used on this study. HEC-FDA is used to perform an integrated hydrologic engineering and economic analysis during the formulation and evaluation of flood risk management plans. BEACH-fx is a certified prototype shore protection 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. Both are USACE-approved planning models.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
HEC-FDA 1.2.5 (Flood Damage Analysis)	The Hydrologic Engineering Center's Flood Damage Reduction Analysis (HEC-FDA) program provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating flood risk management plans using risk-based analysis methods. The program will be used to evaluate and compare the future without- and with-project plans along the Pawcatuck River to aid in the selection of a recommended plan to manage flood risk.	Certified
BEACH-fx 1.0	The Corps Engineer Research and Development Center (ERDC), Coastal and Hydraulics Laboratory developed this life-cycle simulation model to strengthen the linkages between engineering analyses (project performance and evolution) and planning functions (alternative analysis and economic justification) with respect to coastal storm damage reduction projects. Beach fx provides a comprehensive analytical framework for evaluating the physical performance and economic benefits and costs of shore protection projects, particularly beach nourishment along sandy shores.	Certified

**b. Engineering Models.** The following engineering models are anticipated to be used in the development of the decision document:

<b>Model Name and Version</b>	<b>Brief Description of the Model and How It Will Be Applied in the Study</b>	<b>Approval Status</b>
MII (Second Generation MCACES software)	The MII cost engineering program will be utilized to develop construction costs of study alternatives. MII provides an integrated cost estimating system (software and databases) that meets the U.S. Army Corps of Engineers (USACE) requirements for preparing cost estimates.	Approved
CEDEP (Corps of Engineers Dredge Estimating Program)	CEDEP will be used to estimate the cost of beach-fill alternatives that require off-shore sources of sand that will be excavated using dredging equipment.	Approved

## 10. REVIEW SCHEDULES AND COSTS

### a. ATR Schedule and Cost.

#### **Draft Report ATR Schedule (budget \$25K):**

- |   |                   |
|---|-------------------|
| 1- Draft Report submitted to ATR team                   | February 14, 2016 |
| 2- Deadline for comments from ATR team into Dr. Checks  | March 1, 2016     |
| 3- Deadline for comments to be evaluated by PDT members | March 15, 2016    |
| 4- Deadline for ATR back-checking                       | March 30, 2016    |

### b. Type I IEPR Schedule and Cost (budget \$50K).

- |  |                   |
|--|-------------------|
| 1- Draft Report submitted to Peer Review team                  | February 14, 2016 |
| 2- Deadline for comments from Peer Review team into Dr. Checks | May 15, 2016      |
| 3- Deadline for comments to be evaluated by PDT members        | May 30, 2016      |
| 4- Deadline for Peer Review back-checking                      | June 15, 2016     |

### c. **Model Certification/Approval Schedule and Cost.** All of the models anticipated to be used for this feasibility study are already certified or approved for use.

## 11. PUBLIC PARTICIPATION

Public participation and comment will be received concurrently with the State and Agency review upon the issuance of the Public Notice signifying the release of the Draft Feasibility Report and Integrated Environmental Assessment (EA). Significant and relevant public comments will be provided to reviewers prior to the initiation of the review period. The final decision document and associated review reports will be made available to the public via the project's web page.

## **12. REVIEW PLAN APPROVAL AND UPDATES**

The North Atlantic Division Commander is responsible for approving this Review Plan. The Commander's approval reflects VT input (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, 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, if necessary, 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 webpage. The latest Review Plan should also be provided to the RMO and home MSC.

## **13. REVIEW PLAN POINTS OF CONTACT**

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

- Home District; Chris Hatfield, Project Manager, (978) 318-8520
- Major Subordinate Command; Chief of Planning, (347) 370-4570
- Sandy Coastal Management Division, Program Manager, (347) 370-4779
- Planning Center of Expertise; CSRM-PCX Deputy Director (347) 370-4571

## ATTACHMENT 1: TEAM ROSTERS

### Vertical Team POCs

	Title	Name	Phone
<b>HQ</b>	CECW-NAD-RIT/Sandy Program Manager - Planning	Laura Cameron	202-761-0108
	Plan Formulation	Andrea Walker	202-761-0316
	Economics	Doug Gorecki	202-761-5450
	Environmental	Jeff Trulick	202-761-1380
	Real Estate	Michael Haskins	202-761-0441
<b>NAD</b>			
	Sandy Coastal Management Division, CENAD-PD-CS, Sandy Investigation Program Manager	Hibba Wahbeh	347-370-4779
	NAD MSC POC	Naomi Fraenkel	917-790-8615
<b>PCX</b>			
	CSDR Planning Center of Expertise Director	Joseph Vietri	347-370-4570
	CSDR PCX Deputy Director	Larry Cocchieri	347-370-4571

### Home District Project Development Team Roster

Title	Name	Org	Phone
Planning – PM	Chris Hatfield	E6L0620	978-318-8520
Environmental Resources	Judy Johnson	E6L0710	978-318-8138
Economics	Denise Kammerer-cody	E6L0720	978-318-8105
Cultural Resources	Kate Atwood	E6L0720	978-318-8537
Hydrology/Hydraulics	John Winkelman	E6L0510	978-318-8615
Civil Design	Mark Godfrey	E6L0310	978-318-8689
Geotechnical	Dara Gay	E6L0540	978-318-8787
Geology/Chemistry	Paul Young	E6L0430	978-318-8597
Cost Engineering	Jeff Gaeta	E6L0301	978-318-8438
Structural Engineering	Thuyen Nguyen	E6L0350	978-318-8466
Mechanical Engineering	TBD	E6L0350	
Electrical Engineering	TBD	E6L0350	
Real Estate	Jeffrey Teller	E6N0100	978-318-8030

## ATR Project Development Team Roster

Title	Name	Phone
ATR Lead/Planning	TBD	
Environmental Resources	TBD	
Economics	TBD	
Cultural Resources	TBD	
Hydrology/Hydraulics	TBD	
Civil Design	TBD	
Geotechnical	TBD	
Geology/Chemistry	TBD	
Cost Engineering	TBD	
Structural Engineering	TBD	
Mechanical Engineering	TBD	
Electrical Engineering	TBD	
Real Estate	TBD	
Cost Estimates	TBD	

**ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS**

**COMPLETION OF AGENCY TECHNICAL REVIEW**

The Agency Technical Review (ATR) has been completed for the <type of product> for <project name and location>. 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<sup>sm</sup>.

SIGNATURE

Name  
ATR Team Leader  
Office Symbol/Company

Date

SIGNATURE

Name  
Project Manager  
Office Symbol

Date

SIGNATURE

Name  
Architect Engineer Project Manager<sup>1</sup>  
Company, location

Date

SIGNATURE

Name  
Review Management Office  
Representative  
Office Symbol

Date

## 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

Chief, Engineering Division

Office Symbol

\_\_\_\_\_  
Date

SIGNATURE

\_\_\_\_\_  
Name

Chief, Planning Division

Office Symbol

\_\_\_\_\_  
Date

<sup>1</sup> Only needed if some portion of the ATR was contracted

**ATTACHMENT 3: REVIEW PLAN REVISIONS**

<b>Revision Date</b>	<b>Description of Change</b>	<b>Page / Paragraph Number</b>



#### ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
AFB	Alternative Formulation Briefing	NED	National Economic Development
ASA(CW)	Assistant Secretary of the Army for Civil Works	NER	National Ecosystem Restoration
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
CSDR	Coastal Storm Damage Reduction	O&M	Operation and maintenance
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
ER	Ecosystem Restoration	PAC	Post Authorization Change
FDR	Flood Damage Reduction	PMP	Project Management Plan
FEMA	Federal Emergency Management Agency	PL	Public Law
FRM	Flood Risk Management	QMP	Quality Management Plan
FSM	Feasibility Scoping Meeting	QA	Quality Assurance
GRR	General Reevaluation Report	QC	Quality Control
Home District/MSD	The District or MSD responsible for the preparation of the decision document	RED	Regional Economic Development
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMC	Risk Management Center
IEPR	Independent External Peer Review	RMO	Review Management Organization
ITR	Independent Technical Review	RTS	Regional Technical Specialist
LRR	Limited Reevaluation Report	SAR	Safety Assurance Review
MCX	Mandatory Center of Expertise	USACE	U.S. Army Corps of Engineers
MSC	Major Subordinate Command	WRDA	Water Resources Development Act