DEPARTMENT OF THE ARMY
NORTH ATLANTIC DIVISION, US ARMY CORPS OF ENGINEERS
FORT HAMILTON MILITARY COMMUNITY
BROOKLYN, NEW YORK 11252-6700

REPLY TO
ATTENTION OF

DEC 14 2012

CENAD-PD-PP

MEMORANDUM FOR Commander, New York District, ATTN: CENAN-PL

SUBJECT: Review Plan Approval for Lower Saddle River and Sprout Brook, Bergen County, New Jersey Limited Reevaluation Report

1. The attached Review Plan for the subject study has been prepared in accordance with EC 1165-2-209, Civil Works Review Policy.

2. The Review Plan has been coordinated with the Flood Risk Management Planning Center of Expertise of the South Pacific Division, which is the lead office to execute this plan. For further information, contact Mr. Eric Thaut at 415-503-6852. The Review Plan includes independent external peer review.

3. I hereby approve this Review Plan, which 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.

Encl

KENT D. SAVRE
Colonel, EN
Commanding

REVIEW PLAN

LOWER SADDLE RIVER AND SPROUT BROOK
Bergen County, New Jersey
Limited Reevaluation Report

New York District

MSC Approval Date: TBD
Last Revision Date: 02 April 2012

US Army Corps
of Engineers ®

REVIEW PLAN

LOWER SADDLE RIVER AND SPROUT BROOK (NJ)

Limited Reevaluation Report

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1. PURPOSE AND REQUIREMENTS

a. Purpose. The sole purpose of the project is to protect the properties located along Lower Saddle River and Sprout Brook from flooding. According to the past records, flooding has occurred in the Saddle River basin in New Jersey. The Lower Saddle River and Sprout Brook flooding area boundaries are the Bergen County municipalities of Garfield, Wallington, South Hackensack, Lodi, Saddle Brook, Rochelle Park, Paramus and Fair Lawn, New Jersey.

b. References

(1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
(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, dated February 2005
(6) MSC (North Atlantic Division) and/or District (New York District) Quality Management Plan(s)

c. Requirements. This review plan was developed in accordance with EC 1165-2-209, 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 1165-2-209) 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 Flood Risk Management Center of Expertise, South Pacific Division

The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies. Because there is potential risk for life safety, the Risk Management Center of Expertise (RMC) will be consulted during the development of the scope of the Type I IEPR to include those Safety Assurance Review factors that should be reviewed for this study.

3. STUDY INFORMATION

a. Decision Document. To protect existing establishments and maintain safe living standards along the Lower Saddle River and its tributary in Bergen County, New Jersey, a plan was authorized by U.S. Congress. This plan was stated in the General Design Memorandum (GDM) Phase II – Project Design,

published in June 1996. The authorized plan of improvement includes widening and deepening of the existing channel, some channel realignment, new retaining walls, gabion walls, bank stabilization on the excavated side slopes and channel inverts, raising and replacing, and modification of existing bridges as needed. The channel will have either a trapezoidal cross-section with excavated side slopes on both banks, semi-trapezoidal channel with excavated side slope on one bank and retaining wall on the other bank, or rectangular cross-section with retaining walls on both banks.

b. **Study/Project Description.** The authorized plan for the Lower Saddle River channel improvements consist of 20,117 linear feet (3.81 miles) of trapezoidal channel, 4,458 linear feet (0.84 miles) of semi-trapezoidal channel and 2,026 linear feet (0.38 miles) of rectangular channel. From station 0+00 at the confluence of the Passaic River and Lower Saddle River, the channel bottom will be 55 feet wide until station 14+00 upstream. From station 14+00 to 34+00, the channel bottom will transition to 45 feet wide. From station 34+00, the channel bottom will remain a constant width of 45 feet until the upstream of Outwater Lane. The channel transitions to a 30 foot bottom width from this point upstream to the upper limit of the project at Otto C. Pehle Pond. Along with the proposed channel modification, a "V" shaped pilot channel is proposed along the channel bottom. The pilot channel will be 10 feet wide and 2 feet deep.

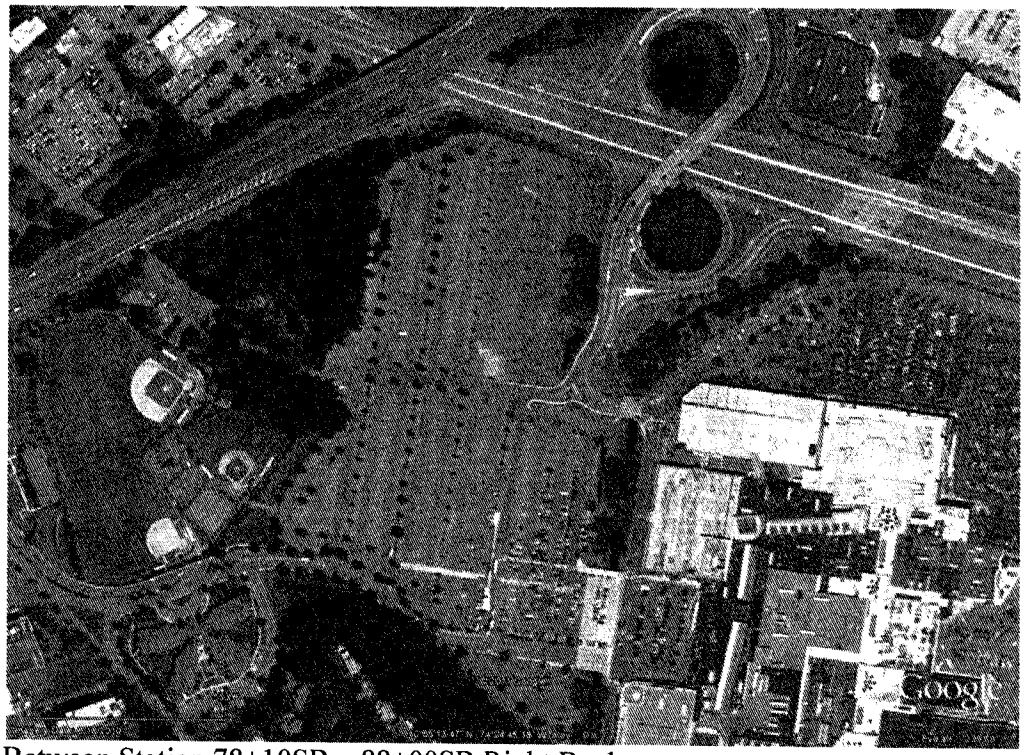
   The proposed side slopes of the excavated bank of the river are either 2H: 1V or 2.5H: 1V depending on the stability of the soil along the banks. The channel invert slope varies from 0.12% to 1.4%. The amount of excavation required for the deepening varies along the channel based on the proposed channel and existing channel invert. The average depth of proposed channel cut from station 0+00 to upstream of Outwater Lane varies from 2 to 7.5 feet. Upstream of Outwater Lane to the project limits the average depth of proposed cut is 6 feet. Bedrock excavation also may be required at some places. The approximate depth of bedrock excavation varies from 8.5 to 13 feet.

   To protect the channel from erosion, riprap and other bedding material will be used to stabilize the channel bottom and invert. The excavated side slope of the river banks will be stabilized either with grass, riprap or by other means to minimize the erosion along the banks of the Lower Saddle River. To accommodate all the modifications, seven bridges along the Saddle River will need to be modified.

   The authorized plan for Sprout Brook improvements will include 5,892 linear feet of trapezoidal channel section, 1,915 linear feet of semi-trapezoidal section and 993 linear feet of rectangular channel section. From its confluence with Lower Saddle River to the upstream limit of Sprout Brook, the channel bottom width will be 25 feet. The Sprout Brook project limit ends 300 feet downstream from the Garden State Parkway.

   The plan proposes the channel invert slope to be 0.08% for the entire length of channel. The side slopes on the excavated bank of the brook will be either 2H:1V or 2.5H:1V depending on the stability of the soil along the banks. A pilot channel will be provided at the channel bottom. The pilot channel will be "V" shaped measuring 8 feet wide and one foot deep. The average depth of cut will be about 2.5 feet below the existing channel bottom. Riprap or other bedding material will be used to stabilize the banks and channel invert as necessary. In order to meet the design requirements, five bridges will have to be modified within the Sprout Brook project limits. Below are three aerial photographs taken in 2010 which detail the sites which are part of this study:

Between Station 95+00SR – 107+30SR Left Bank



Between Station 78+10SB – 88+00SB Right Bank

Between Station 59+00SB – 75+90SB L & R Bank

c. **Factors Affecting the Scope and Level of Review.** Since the submission of the General Design Memorandum in June 1996, development along the banks of Lower Saddle River and Sprout Brook in Bergen County, New Jersey has occurred, so the existing conditions are different than they were in 1996. These new developments may hinder or obstruct the proposed flood reduction plan authorized by U.S. Congress for implementation. Therefore, the authorized plan was compared with the current conditions to determine any obstacles. Necessary actions have been taken to maintain the proposed authorized plan to the highest degree possible while incorporating the new developments along the river banks as well.

c. **In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. The in-kind products and analyses to be provided by the non-Federal sponsor include: The in-kind products and analyses to be provided by the non-Federal sponsor are currently being negotiated under the Project Management Plan. This Review Plan will be updated as in-kind services are indentified.

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.

a. **Documentation of DQC.** District Quality Control will be conducted on all decision documents and interim reports as noted below in Section 4(b) of this Review Plan. Documentation for all DQC reviews will be provided in DrChecks and included in a Quality Control Appendix of all decision documents and interim reports.

b. **Products to Undergo DQC.** Products under this study to undergo DQC include the IPR (FSM equivalent for a GRR study), AFB report, and draft Feasibility Report.

c. **Required DQC Expertise.** The expertise required for this study will be somewhat extensive. Expertise may be required for structural engineering, civil engineering, geotechnical engineering, cost engineering, hydraulic engineering, hydrologic engineering, and environmental resources, cultural Resources, HTRW, Plan Formulation, Real Estate and Economics, depending on the alternatives that may be analyzed.

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.** Products under this study to undergo ATR include the FSM, AFB report, and draft/final Feasibility Report. Additionally, where practicable, technical products that support subsequent analyses may be reviewed prior to being used in the study and may include: surveys & mapping, hydrology & hydraulics, geotechnical investigations, economic, environmental, cultural, and social inventories, annual damage and benefit estimates, cost estimates, etc.

b. **Required ATR Team Expertise.** The appropriate RMO, in cooperation with the PDT, vertical team, and other appropriate centers of expertise, will determine the final make-up of the ATR team. The following table provides the types of disciplines that should be included on the ATR team and the expertise required. The names, organizations, contact information, credentials, and years of experience of the ATR members will be included in Attachment 1 once the ATR team is established.

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).
Planning	The Planning reviewer should be a senior water resources planner with experience in formulation of flood risk management studies especially in urban, highly developed areas.

Economics	The economics reviewer should have extensive experience in urban flood risk management studies and a thorough understanding of HEC-FDA.
Environmental Resources	Team member will have independently completed EA/EIS's and be well versed in the NEPA process, partnerships with other environmental resource agencies and environmental concerns and constraints within urban settings.
Cultural Resources	Team member will have experience with 106 actions and documentation including mitigation for historical structures and archeological artifacts.
Hydrology	Team member should be an expert in the field of urban hydrology and hydraulics, have a thorough understanding of flash flooding and the use of HEC computer modeling systems.
Hydraulic Engineering	Team member should be an expert in the field of urban hydrology and hydraulics, have a thorough understanding of open channel systems and the use of HEC computer modeling systems. A certified professional engineer is required
Geotechnical Engineering	Team member should have expertise in tunnel design and large auger boring construction techniques. A certified professional engineer is required
Civil Engineering	Team member will have a thorough understanding of design of diversion tunnels and channel improvements in an urban setting. A certified professional engineer is required.
Structural Engineering	Team member will have a thorough understanding of both structural and non-structural measures to include, but not be limited to, retaining walls, channel improvements and tunnels. A certified professional engineer is required.
Risk Reviewer	A team member will be added to the ATR team to assess risk in accordance with the November 2010 memorandum by Mr. James Dalton (USACE)
Cost Engineering	Team member will be familiar with cost estimating for similar projects in MII. Review includes construction schedules and contingencies for any document requiring Congressional authorization. The team member will be a registered Professional Engineer, Certified Cost Technician, a Certified Cost Consultant, or a Certified Cost Engineer. As the Cost Engineering Center of Expertise, Walla Walla District will assign this team member as part of a separate effort coordinated by the ATR or IEPR team lead in conjunction with the geographic district's project manager. The team member will also be required to review a cost risk analysis as the total project cost is more than likely to exceed $45M.
Real Estate	Team member will be have at least 5 years experience with flood risk management studies and be familiar with urban planning and acquisition strategies.
Hazardous, Toxic and Radioactive Waste (HTRW)	Team member should have knowledge of HTRW issues common to urban environments and developed areas.

c. **Documentation of ATR.** DrChecks review software (https://www.projnet.org/projnet/) 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 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.

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 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, for the initial IPR, the subsequent IPRs, AFB, 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 1165-2-209, is made as to whether IEPR is appropriate. 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:

- 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 1165-2-209.

- 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.** In accordance with Section 2034 of the Water Resources Development Act of 2007 (P.L. 110-114), Independent External Peer Review shall be conducted for all projects with an estimated total cost of greater than $45M dollars. We do not expect the total project costs for this project will be in excess of this amount. However, other criteria, such as innovative solutions and life safety issues could also trigger the requirement for EPR. Therefore, if necessary, EPR would be conducted to identify, explain, and comment upon assumptions that underlie economic, engineering, and environmental analyses, as well as to evaluate the soundness of models and planning methods. This task would be supported by the New York District's Planning Division for a cost of $500,000 (this task is 100% Federal Cost) if necessary.

   The District Chief of Engineering's statement of finding is presented in Attachment 5 of this Review Plan.

b. **Products to Undergo Type I IEPR.** At minimum, Type I IEPR will be performed for the entire decision document (including supporting documentation), which is typically available at the draft report stage; however, it is anticipated to initiate IEPR early in the study process to reduce the chances of significant changes to the decision document occurring at the end of the study due to IEPR panel

findings and recommendations. Because of likely complexity and magnitude of the study, IEPR may be performed for key interim technical products and major milestone documents (e.g., FSM and AFB).

c. **Required Type I IEPR Panel Expertise.** The expertise represented on the Type I IEPR panel will be similar to those on the ATR team. Because this GRR will be a very large and/or complex study, the IEPR panel is anticipated to involve as many disciplines/individuals as the ATR team. At minimum, the panel should include the necessary expertise to assess the engineering, environmental, and economic adequacy of the decision document as required by EC 1165-2-209, Appendix D. The PDT has made the initial assessment of what expertise is needed based on the PMP and the factors affecting the scope and level of review outlined in Section 3 of the review plan. The Outside Eligible Organization (OEO) will determine the final participants on the panel. The following table provides the types of disciplines that might be included on the IEPR team and a description of the expertise required.

IEPR Panel Members	Expertise Required
Plan Formulation	The Planning reviewer should be a senior water resources planner with experience in formulation of flood risk management studies especially in urban, highly developed areas.
Economics	The economics reviewer should have extensive experience in urban flood risk management studies and a thorough understanding of HEC-FDA.
Environmental Resources	Team member will have independently completed EA/EIS's and be well versed in the NEPA process, partnerships with other environmental resource agencies and environmental concerns and constraints within urban settings.
Hydrology	Team member should be an expert in the field of urban hydrology and hydraulics, have a thorough understanding of flash flooding and the use of HEC computer modeling systems.
Hydraulic Engineering	Team member should be an expert in the field of urban hydrology and hydraulics, have a thorough understanding of open channel systems and the use of HEC computer modeling systems. A certified professional engineer is required
Geotechnical Engineering	Team member should have expertise in tunnel design and large auger boring construction techniques. A certified professional engineer is required
Civil Engineering	Team member will have a thorough understanding of design of diversion tunnels and channel improvements in an urban setting. A certified professional engineer is required.
Structural Engineering	Team member will have a thorough understanding of both structural and non-structural measures to include, but not be limited to, retaining walls, channel improvements and tunnels. A certified professional engineer is required.

d. **Documentation of Type I IEPR.** The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO) per EC 1165-2-209, 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 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.

Type I IEPR interim products (such as individual technical products or milestone documents) may be performed. These interim reviews will be documented as noted above.

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 DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION

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

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

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
HEC-FDA 1.2.5a (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 Passaic River and major tributaries to aid in the selection of a recommended plan to manage flood risk.	Certified
Habitat Evaluation Procedures (HEP)	HEP is an established approach to assessment of natural resources. The HEP approach has been well documented and is approved for use in Corps projects as an assessment framework that combines resource quality and quantity over time, and is appropriate throughout the United States. The Habitat Suitability Index (HSI) models are the format for quantity determinations that are applied within the HEP framework.	New HSI models developed by the Corps are subject to certification. Published HIS models, while peer reviewed and possibly tested by the developers are subject to review and approval by the PCX. Modifications to published HSI models where relationships or formulas are changed may be subject to certification.
Stream Impact Assessment spreadsheet model	Some of the alternatives selected for evaluation may involve river channelization and the creation of a diversion culvert. Currently, there is no state specific or regional method that focuses on quantifying stream function and impacts resulting from channel modification activities that could be applied to	Not certified; will initiate approval process following conclusion of analysis and prior to ATR of the draft report.

	this project. Therefore, if necessary, the PDT will create a series of worksheets modeled after those developed and implemented by the Regulatory Divisions at the USACE Kansas City, Little Rock, Omaha and Rock Island Districts that quantifies the adverse impacts caused by the proposed activity and establishes the appropriate level and type of mitigation required to compensate for the impacts.	

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

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
HEC-RAS 4.0 (River Analysis System)	The Hydrologic Engineering Center's River Analysis System (HEC-RAS) program provides the capability to perform one-dimensional steady and unsteady flow river hydraulics calculations. The program will be used for steady/unsteady flow analysis to evaluate the future without- and with-project conditions along the Passaic and its tributaries	HH&C CoP Preferred Model
HEC-HMS	This model will be used to define the watersheds' physical features; describe the metrological conditions; interior drainage analysis; estimate parameters; analyze simulations; and obtain GIS connectivity	HH&C CoP Preferred Model

10. REVIEW SCHEDULES AND COSTS

a. ATR Schedule and Cost. ATR Schedule and Cost. The ATR process for this document will follow the timeline below. Actual dates will be scheduled once the period draws closer. The FSM review will begin in the 1st Quarter of FY 2013. Review of the AFB will begin in the 1st Quarter of FY 2014. The certification of the AFB, Draft Feasibility Report and Final Feasibility Report will follow the completion of each review.

Task/Milestone	Date
ATR of draft Report	October 2013
ATR Certification of Draft Report	January 2014
Draft Feasibility Report Complete	September 2014
Public Review of Draft Report	July 2015
Final Report – Completed by District	May 2016
ATR Certification/Completion of Final Report	September 2016

b. **Type I IEPR Schedule and Cost.** The IEPR process for this document will follow the timeline below. Actual dates will be scheduled once the period draws closer. The FSM review will begin in the 1st Quarter of FY 2013. Review of the AFB will begin in the 1st Quarter of FY 2014. The certification of the AFB, Draft Feasibility Report and Final Feasibility Report will follow the completion of each review.

Task/Milestone	Date
Initiate IEPR of Draft Report	September 2014
Complete IEPR of Draft Report	June 2015

c. **Model Certification/Approval Schedule and Cost.**
The Stream Impact Assessment spreadsheet model will be used in the analysis and will require certification. Some of the alternatives selected for evaluation may involve river channelization and the creation of a diversion culvert. Currently, there is no state specific or regional method that focuses on quantifying stream function and impacts resulting from channel modification activities that could be applied to this project. Therefore, if necessary, the PDT will create a series of worksheets modeled after those developed and implemented by the Regulatory Divisions at the USACE Kansas City, Little Rock, Omaha and Rock Island Districts that quantifies the adverse impacts caused by the proposed activity and establishes the appropriate level and type of mitigation required to compensate for the impacts. Anticipated schedule for workshops and certification is concurrent with compilation of the draft report and prior to ATR certification of the document in January 2014.

d. **PUBLIC PARTICIPATION**

Public review of the draft report will occur after completion of the ATR and IEPR and concurrence by NAD and HQUSACE that the document is ready for public release. As such, public comments other than those provided at any public meetings held during the planning process will not be available to the review team. However, the PDT may hold an "information session" with the public to describe the recommendations and findings and to gather public opinion information, which will then be available to the IEPR Panel.

Public review of the draft report will begin approximately one (1) month after the completion of the ATR process and policy guidance memo. The period will last 30 days as required. Public review comments will be forwarded to the ATR Team Leads upon completion of the public review comment period.

A formal State and Agency review will occur concurrently with the public review. However, it is anticipated that intensive coordination with these agencies will have occurred concurrently with the planning process.

Upon completion of the review period, comments will be consolidated and addressed if needed. A comment resolution meeting will take place if needed to decide upon the best resolution of comments. A summary of the comments and resolutions will be included in the final document.

The project is not likely to have significant interagency interest beyond representation on the project steering committee.

e. 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 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. 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, will be posted on the Home District's webpage. The latest Review Plan will also be provided to the RMO and home MSC.

f. REVIEW PLAN POINTS OF CONTACT

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

- Section Chief, FRM and ECO, Plan Formulation Branch, 917-790-8720
- Team Leader, NAD Planning and Policy CoP, 347-370-4514
- Leader, Flood Risk Management Planning Center of Expertise, 415-503-6852

ATTACHMENT 1: TEAM ROSTERS

a. Project Delivery Team

Name	Role	Phone Number	e-mail
Daniel Falt	Project Manager	917-790-8614	Daniel.T.Falt@usace.army.mil
Elena Manno	Project Engineer/Hydraulic Engineer	x-8371	Elena.n.manno@usace.army.mil
Kevin Whorton, P.E.	Civil Engineer	x-8065	Kevin.a.whorton@usace.army.mil
Michael Chen, P.E.	Structural Engineer	x-8749	xiaoming.chen@usace.army.mil
Gennaro Cimmino	Geotechnical Engineer	x-8281	Gennaro.j.cimmino@usace.army.mil
Thomas Sessa, P.E.	Electrical Engineer	x-8272	Thomas.e.sessa@usace.army.mil
Anthony Schiano	Cost Engineering	x-8347	Anthony.Schiano@usace.army.mil
Seung Baek	Engineering Technical Manager	x-8226	Sueng.c.baek@usace.army.mil
Andre Chauncey, P.E.	Hydrology	x-8353	andre.t.chauncey@usace.army.mil
Jodi McDonald	Section Chief, Plan Formulation	x-8727	jodi.mcdonald@usace.army.mil
	Plan Formulation	x-8705	
Caroline McCabe	Economics	x-8615	Caroline.M.McCabe@usace.army.mil
Nancy Brighton	Section Chief, Environmental Analysis	x-8703	Nancy.J.Brighton@usace.army.mil
Matthew Voisine	Biology/NEPA	x-8718	matthew.voisine@usace.army.mil
Carissa Scarpa	Cultural Resources	x-8612	Carissa.a.scarpa@usace.army.mil
Michael Weiss	Real Estate	x-8450	Michael.C.Weiss@usace.army.mil
Ellen Simon	Office of Counsel	x-8158	Ellen.b.simon@usace.army.mil
Christopher Gardner	Project Public Relations Specialist	x-8108	Christopher.p.gardner@usace.army.mil

b. ATR Team

Name	Role	Review District
TBD	ATR Lead/Plan Formulation	TBD
TBD	Civil Design	TBD
TBD	Biology/NEPA	TBD
TBD	Hydrology/Hydraulics	TBD
TBD	Economics	TBD
TBD	Cost-Engineering*	TBD
TBD	Real Estate	TBD
TBD	Cultural Resources	TBD

* The cost engineering team member nomination will be coordinated with the NWW Cost Estimating Center of Expertise as required. NWW will determine if the cost estimate will need to be reviewed by PCX staff. **All resumes will be reviewed and approved by the PCX prior to initiating any ATR.

c. Vertical Team

Name	Role	Phone Number	Email
Thomas J. Hodson, J.D., pH.D	NAN Plan Formulation Branch Chief	917-790-8602	Thomas.J.Hodson@usace.army.mil
Anthony Ciorra, P.E.	NAN PPMD Civil Works Branch Chief	917-790-8208	Anthony.ciorra@usace.army.mil
Leonard J. Houston	NAN Environmental Analysis Branch Chief	917-790-8702	Leonard.houston@usace.army.mil
Frank Santangelo, P.E.	NAN Civil Resources Branch Chief	917-790-8266	Frank.a.santangelo@usace.army.mil
Cliff Jones	NAD Planning CoP	347-370-4514	clifford.s.jones@usace.army.mil
Joe Forcina	NAD DST Lead	347-370-4584	Joseph.Forcina@usace.army.mil
Cathy Shuman	NAD RIT	202-761-5782	Catherine.M.Shuman@usace.army.mil
Eric Thaut	FRM PCX Lead	415-503-6852	Eric.w.thaut@usace.army.mil

d. IEPR Team

Name	Role
TBD	ATR Lead/Plan Formulation
TBD	Civil Design
TBD	Biology/NEPA
TBD	Hydrology/Hydraulics
TBD	Economics
TBD	Cost-Engineering
TBD	Real Estate
TBD	Cultural Resources

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECSION 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 1165-2-209. 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 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number
24 October 2012	Update of dates and revise milestones to align with SMART Planning.	Pages 12-13

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
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
DX	Directory of Expertise	OEO	Outside Eligible Organization
EA	Environmental Assessment	OSE	Other Social Effects
EC	Engineer Circular	PCX	Planning Center of Expertise
EIS	Environmental Impact Statement	PDT	Project Delivery Team
EO	Executive Order	PAC	Post Authorization Change
ER	Ecosystem Restoration	PMP	Project Management Plan
FDR	Flood Damage Reduction	PL	Public Law
FEMA	Federal Emergency Management Agency	QMP	Quality Management Plan
FRM	Flood Risk Management	QA	Quality Assurance
FSM	Feasibility Scoping Meeting	QC	Quality Control
GRR	General Reevaluation Report	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	RTS	Regional Technical Specialist
ITR	Independent Technical Review	SAR	Safety Assurance Review
IPR	Interim Progress Report	USACE	U.S. Army Corps of Engineers
LRR	Limited Reevaluation Report	WRDA	Water Resources Development Act
MSC	Major Subordinate Command		

ATTACHMENT 5: DISTRICT CHIEF OF ENGINEERING'S STATEMENT OF FINDING

CENAN-EN-MC-F 19 November 2012

MEMORANDUM For Record

SUBJECT: Lower Saddle River and Sprout Brook, Bergen County, NJ Flood Risk Management-Risk Informed Assessment of Significant Threat to Human Life

1. Project Information. Flooding occurs in the lower Saddle River basin area along the Saddle River and Sprout Brook in the municipalities of Garfield, Wallington, South Hackensack, Lodi, Saddle Brook, Rochelle Park, Paramus, and Fair Lawn, New Jersey. The two major flood damage areas are Lodi and the Sprout Book confluence area of Rochelle Park and Saddle Brook. The Lower Saddle River Flood Risk Management Project was authorized for construction under Section 401 (a) of the Water Resources Development Act of 1986 (Public Law 99-662) dated 17 November 1986. The authorized project is based upon the Chief of Engineers Report dated January 28, 1986. The State of New Jersey, acting through the Department of Environmental Protection, is the non-Federal sponsor for the project. A Review Plan is being prepared for a decision document for the project.

2. Project Description. The authorized project consists of channel modification along 5.2 miles of the lower Saddle River and 1.7 miles along Sprout Brook, bridge modifications, fish and wildlife mitigation measures, and aquatic habitat improvement structures.

3. Risk Informed Assessment. In accordance with EC 1165-2-209 (31 January 2010), Civil Works Review Policy, a risk informed assessment was made as to whether there is a significant threat to human life from the authorized flood risk management project. The key factors considered are shown in Table 1.

4. Determination. Based on a risk informed assessment which considered life safety factors, I have determined that there is a significant threat to human life associated with the Lower Saddle River and Sprout Brook, Bergen County, NJ Flood Risk Management Project. Accordingly, a Safety Assurance Review as part of a Type I Independent External Peer Review (IEPR) is warranted.

Encl

ARTHUR J.CONNOLLY, P.E.
Chief, Engineering Division

Table 1: Lower Saddle River and Sprout Brook, Bergen County, NJ Flood Risk Management-
Risk Informed Assessment of Significant Threat to Human Life

No.	Risk Factor (Significant Threat to Life Safety)	Risk Magnitude	Basis of Concern	Risk Assessment
1	Land Use Adjacent to Project	Medium	The Lower Saddle River project area encompasses eight municipalities located in Bergen County, NJ. These include South Hackensack, Lodi, Saddle Brook, Rochelle Park, Fair Lawn , Paramus, Garfield, and Wallington.	The flood damage prone areas range from highly urban in Lodi to suburban communities. Land use is residential, industrial and commercial. Risk assessment details are provided in 1a-e below.
1a	Population Density	Medium	The project area municipalities encompass approximately 25.4 square miles with an estimated population of 146,010, or 5,754 persons/sq.mi.	Due to population density, many people could be affected by flooding or by project failure.
1b	Critical Facilities Affected (Schools hospitals, emergency vehicle and evacuation routes	Medium	Critical facilities in the project area include one senior housing complex, two schools, one police station, two fire stations, two electric utilities, two DPW/transfer stations, one church, and two libraries. Major transportation routes include Route 46, Route I-80, Route 4, Route 17, the Garden State Parkway, Conrail Railroad and the New York Susquehanna & Western Railroad.	Multiple bridges will need to be modified as part of the channel modifications. The bridges convey an Interstate highway (I80), the Garden State Parkway, Routes 4 and 46, railroad and local roads and streets. Failure of one of these bridges could represent a significant threat to human life as well as a loss of key infrasturucture required by emergency vehicles and evacuation routes.
1c	Number and types of structures in the flood plain	Medium	There are 2350 residential structures and 250 non-residential structures in the project area.	Floodplain structures include single family residential structures, apartment complexes, industrial and commercial structures, including a highly utilized regional shopping mall. Although many structures could be affected by flooding or project failure, sufficient evacuation routes exist to remove the population and reduce the risk to life and safety.

1d	Existing Hazardous Materials	Medium	There are known sites within the footprint of the channel modiifcation that contain hazardous and toxic materials that requrie remediation.	Construction plans & specs will identify the areas which contain know and suspected contaminated materials. During construction, appropriate personnel protection equipment will be used and work will be done in conformance with regulations and laws governing construction site monitoring, excavation and disposal of contaminated material.
1e	Existing Utilities	Medium	Human safety risk exists due to uncertainty of utility locations (esp. electrical and sewage lines).	Utility survey will be conducted as part of the PED work in order to help mitigate this risk.
2	Structural failure of project components and/or existing structures	High	Uncertainty in design perameters, failure to comply with proven construction techniques.	Structural failure of a project component specifically bridges or walls is unlikely due to the use of proven design and constructrion techniques. However a faliure of a structural component is likely to result in the lost of human life, significant loss to the public infrastructure with effects on the local economy and quality of life.
2a	Undermining of bridge substructures	Medium	Uncertainity in soil/rock locations may increase risk to bridge stability during and after channel modifications.	Thorough inspection of bridge substructure during and after channel modification will lessen the risk of failure. Age and condition of existing structures may increase chance of unforseen damage during and after construction.
2b	Residential Street/Bridge Damage	Low	Heavy Trucks used during construction may damage the residential streets/bridges increasing the chance of vehicle/bicycle/pedestrian accidents due to uneven streets.	Ensuring construction routes can carry heavy truck loads will reduce damage. In addition, periodic inspection of these routes will aid in early detection of major damage.
2c	Bridge Impact Damage	Low	Flooding of the channel can result in bridge damage due to debris impact.	Channel modification will increase the channel depth decreasing the risk of debris impact to the bridges.
2d	Soil Erosion	Low	Erosion of soils may result which could undermine structures.	Construction of channel modification will lessen the risk of soil erosion by providing scour protection in high velocity areas.
2e	Sprout Brook Bridges	High	Lack of as-builts, bridge cross-sections, material properties, and other information increases damage risk to bridge structures during channel modifications.	Ensuring continous monitoring of bridges during channel modification may prevent catastrophic failure of bridge structures at some of these locations.

3	Use of Unique or Non-traditional Methods			
3a	Design methods	Low	Unique or non-traditional design methods may be poorly understood or inadequately designed and may be subject to failure than proven design methods.	Traditional design methods that are in accordance with Corps of Engineeers guidance will be used. No innovative or precedent setting methods or models were used.
3b	Design Features	Low	Unique or non-traditional design features may be poorly understood or inadequately designed and may be more subject to failure than proven design features.	Design of the project features fall within prevailing practice and include only traditional design features.
3c	Construction materials or methodologies	Medium	Unique or non-traditional construction materials or methods may be poorly understood or inadequately executed, resulting a project feature that may be more subject to failure than those built with proven materials and methods.	Although materials and methodologies are not unique, there is an inherent risk in the methodologies that will be used including keeping existing traffic in operations while underpinning the foundations of bridges and structures which can present a threat to life and property.
3d	Does this project have unique construction sequencing or a reduced or overlapping design/ construction schedule?	Low	Unique or accelerated construction sequencing may lead to poor quality work, leading to greater possiblilty of future project failure.	The project does not have any accelerated design or construction scheduling.
4	*Does the project design require:*			
4a	Redundancy	Low	Failure of one critical project element would result in sudden, catastrophic damage. Duplication of critical components of the protective system is required to increase the reliability of the system.	This channel and bridge modification plan greatly reduces the risk to human life and property relative to the without project condition. Nonperformance of the project would result in flood levels less than or equal to those present under without-project conditions.
4b	Resiliency	Low	Capacity of the channel is reduced over time.	Project is designed based on future condition flows. Adherence to OMRR&R requirements will ensure that the project remains at full operating efficiency.
4c	Robustness	Low	Natural events can occur that are greater than the optimized design and may lead to project failure.	Structural failure of a project component specifically bridges or walls is unlikely due to the use of proven design and constructrion techniques. However a faliure of a structural component is likely to result in the lost of human life, significant loss