



REPLY TO
ATTENTION OF

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

DEC 14 2012

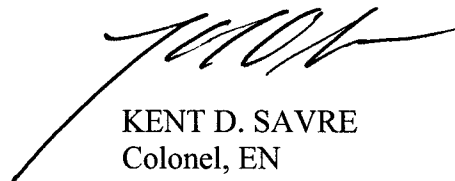
CENAD-PD-PP

MEMORANDUM FOR Commander, Baltimore District, ATTN: CENAB-PL

SUBJECT: Review Plan Approval for Upper Susquehanna Comprehensive Flood Damage Reduction Study, New York

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 is for Phase I of a two phase process. Phase II would include 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

**UPPER SUSQUEHANNA COMPREHENSIVE
FLOOD DAMAGE REDUCTION, NEW YORK**

**FLOOD RISK MANAGEMENT WATERSHED ANALYSIS
PHASE I**

**U.S. Army Corps of Engineers
Baltimore District**

**MSC Approval Date: TBD
Last Revision Date: 3 Dec 12**



**US Army Corps
of Engineers ®**

REVIEW PLAN

**UPPER SUSQUEHANNA COMPREHENSIVE
FLOOD DAMAGE REDUCTION, NEW YORK**

**FLOOD RISK MANAGEMENT WATERHSED ANALYSIS
PHASE I**

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1. PURPOSE AND REQUIREMENTS

- a. **Purpose.** This Review Plan defines the scope and level of peer review for the Upper Susquehanna Comprehensive Flood Damage Reduction (FDR), New York (NY) - Flood Risk Management (FRM) Watershed Analysis which is Phase I of a two (2) Phase Feasibility Study.

Phase I is designed to serve as the scoping mechanism related to the Planning Smart guide and will include a range of planning and engineering activities designed to assess the current effectiveness and level of protection provided by the existing FRM structures within the Upper Susquehanna River Basin. The guiding principles in Phase I will provide a context for further project development in Phase II. Phase II would involve the following three steps in a Planning Smart guide feasibility study (alternative formulation & analysis, feasibility analysis, and chief's report).

b. References

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, Change 1, 31 Jan 2012
- (2) EC 1105-2-411, Watershed Plans, 15 Jan 2012
- (3) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011
- (4) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
- (5) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
- (6) Planning SMART Guide (<http://planning.usace.army.mil/toolbox/smart.cfm>)
- (7) Upper Susquehanna Comprehensive FDR, NY - FRM Watershed Analysis, Phase I - Project Management Plan
- (8) U.S. Army Corps of Engineers, Baltimore District (USACE) Quality Management Plan

- 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 FRM- PCX.

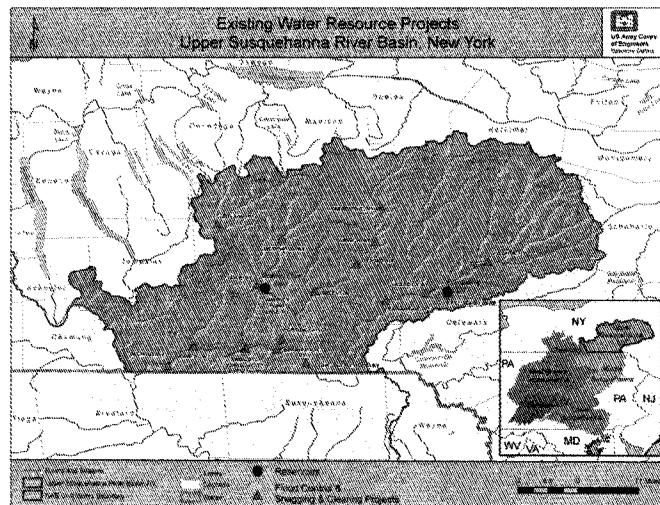
The RMO will not need to coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies because the Upper Susquehanna Comprehensive FDR, NY – FRM Watershed Analysis, Phase I report will not include alternatives and is not a decision document for recommended project authorization or construction. Project authorization and construction will not be accomplished unless Phase II is initiated.

3. STUDY INFORMATION

- a. **Decision Document.** The Upper Susquehanna Comprehensive FDR, NY – FRM Watershed Analysis, Phase I is not a decision document but instead will be a technical analysis of the study area to identify opportunities for a detailed study during Phase II. There will be no need for approval authority with Headquarters USACE (HQUSACE). At the conclusion of Phase I, the results will be provided to NYSDEC. In accordance with ER 200-2-2, a NEPA document will not be conducted until Phase II of the Upper Susquehanna Comprehensive FDR, NY– FRM Watershed Analysis.

- b. **Study/Project Description.** Within New York State, the Upper Susquehanna River Basin drains approximately 4,520 square miles in south central New York. This drainage area includes most of Broome, Chenango, Cortland, Otsego and Tioga Counties; parts of Delaware, Madison and Chemung Counties; and small portions of Schuyler, Tompkins, Onondaga, Oneida, Herkimer and Schoharie Counties. The larger subwatersheds include the Tioughnioga River Subwatershed, which includes the Otselic River Subwatershed, the Unadilla River Subwatershed, the Owego Creek Subwatershed, and the Cayuta Creek Subwatershed. Otsego Lake is the largest lake and accounts for approximately 3% of basin lake acres. The next largest lakes are Canadargo Lake, and Whitney Point Reservoir. The region is characterized by low rolling hills covered by hardwood forests and large wide valleys scattered with agricultural activity. Seventy percent (70%) of the basin is forested; agricultural land uses account for about 25% of the drainage area. Consequently most of the basin population is rural or located in smaller villages and hamlets. The city of Binghamton has the largest population the study area.

Figure 1: Study Area Map



USACE has constructed 20 FRM projects (see Table 1) in this Basin dating back to 1938 that are in place to protect the citizens of the watershed. USACE and New York State Department of Environmental Conservation (NYSDEC) have decided to evaluate these projects as part of a two phase feasibility study. The amount of FRM projects and the size of the river basin are two major reasons for taking a two Phase approach. Many of the areas within the basin are in need of some sort of help and this technical analysis will help direct USACE and NYSDEC to the most vulnerable areas.

In Phase I evaluations and assessments of the current effectiveness and level of protection provided by the existing FRM projects in the Upper Susquehanna River Basin, update the hydrology data and develop a hydrologic watershed model of the entire basin, and provide a mapping analysis that determines how much the levees and/or floodwalls would need to be raised to meet the National Flood Insurance Program (NFIP) requirements (reasonable assurance that the levee system will exclude the 1% annual chance exceedance flood). Furthermore, Phase I will include modeling activities, data gathering, and minor ecological investigations. The goal is to identify key FRM measures, current and future human activities, and associated ecological concerns or potential impacts.

After the technical evaluation and assessment in Phase I, the project team in Phase II of the feasibility study will consider structural modifications and non-structural FRM measures, water supply, environmentally sustainable flow, ecosystem protection and restoration, drought preparedness, and watershed resource management for future development.

USACE was originally given the authority to conduct a reconnaissance study and any ensuing feasibility level investigations by a resolution of the Committee on Transportation and Infrastructure of the United States House of Representatives adopted September 24, 2008, for the Upper Susquehanna River Basin, NY. The authorization that follows was sponsored by Congressman Michael Arcuri, 24th District-New York:

Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That the Secretary of the Army review the report of the Chief of Engineers on the Susquehanna River, New York, Pennsylvania, and Maryland, published as House Document 702, 77th Congress, and other pertinent reports, to determine whether any modifications of the recommendations contained therein are advisable at the present time in the interest of flood damage reduction, including an evaluation of the effectiveness of the existing flood control system in light of current and projected future conditions, and in the interest of comprehensive watershed management, including environmental restoration, structural and non-structural flood damage reduction, and related purposes for the Upper Susquehanna River Basin, within Tioga, Broome, Chenango, Cortland, Otsego, Delaware, Schoharie, Herkimer, Oneida, Madison, Onondaga, Tompkins, Schuyler, and Chemung Counties, New York.

- c. **Factors Affecting the Scope and Level of Review.** There will be no recommended project at the conclusion of the Upper Susquehanna Comprehensive FDR, NY – FRM Watershed Analysis, Phase I. So the study will not require Congressional Authorization at that time; the level of proposed review is reflective of that. Phase I is a technical evaluation and assessment of the Federal FRM projects in the Upper Susquehanna River Basin, New York.

In accordance with EC 1165-2-209, an evaluation of risk informed decisions on peer review and life safety risk was completed. Phase I will not include any FRM alternatives or make recommendations that would impact a structure or feature of a structure whose performance involves potential life safety risks. In addition, the technical analysis being conducted during Phase I poses no threat to human life, will not cost more than \$45 million, is not considered controversial, and will not include novel precedent setting approaches. As a result, it would be premature for the CENAB Chief of Engineering to complete an evaluation of threats to human life because there would not be analyses of FRM measures or alternatives during Phase I. When preparing a revised PMP and review plan for Phase II, the CENAB Chief of Engineering will complete the appropriate evaluation of life safety in accordance with EC 1165-2-209. The Planning Smart Guide, Risk Register tool will be used in Phase I and help document risk as the study moves forward and potentially into Phase II.

- d. **In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services toward Phase I are subject to DQC and ATR. The in-kind products and analyses to be provided by the non-Federal sponsor will be updated in the coming months when this information is known.

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.** Reviewers shall review the technical report to confirm that the work was done in accordance with established professional principles, practices, codes, and criteria and for compliance with laws and policy. Reviewers shall pay particular attention to one's discipline but may also comment on other aspects as appropriate. Review comments shall contain these principal elements: a clear statement of the concern, the basis for the concern (such as law, policy, and guidance), the significance of the concern, and specific actions needed to resolve the comment. Reviewers that do not have any significant comments pertaining to their assigned discipline shall provide a comment stating this.
- b. **Products to Undergo DQC.** Products to undergo DQC include the Upper Susquehanna Comprehensive FDR, NY – FRM Watershed Analysis Report and Appendices, Phase I.
- c. **Required DQC Expertise.** The following section identifies the required expertise needed to conduct DQC consistent with the District/MSD Quality Management plans.

DQC Team Members/Disciplines	Expertise Required
Planning	The reviewer should have recent experience in reviewing Plan Formulation processes for multi-objective studies and be able to draw on “lessons learned” in advising the PDT of best practices.
Economics	The reviewer should be familiar with the processes used in evaluation of FRM projects and have recent experience in preparing economic analysis plans for FRM feasibility studies. HEC-FDA will be used for analysis.
Environmental Resources	The reviewer should have a solid background in the habitat types and environmental conditions of rural and urban floodplains and streams of the Northeast United States.
Cultural Resources	The reviewer should have extensive USACE experience regarding cultural resources on public and tribal lands. They need to be familiar with Department of Defense as well as USACE policies and procedures as they pertain to USACE studies and projects.
Hydrology and Hydraulic Engineering	The reviewer should carry a Professional Engineer’s license and have the ability at a minimum to address river hydraulics and sediment transport, hydrologic statistics and risk analysis, reservoir system analysis, planning analysis, and real-time water control management.
Geotechnical Engineering	The reviewer should carry a Professional Engineer’s license and have recent experience in USACE design requirements for levee work. This person should also have experience in investigating existing subsurface conditions and materials, determining their physical/mechanical properties that are relevant to the project considered, assessing risks posed by site conditions, and designing earthworks and structure foundations.
Civil Engineering	The reviewer should carry a Professional Engineer’s license and have recent experience in the design and of plans and specifications for levees and river bridges, to include tie in to natural features.
Structural Engineering	The reviewer should carry a Professional Engineer’s license and have a thorough understanding of non-structural measures, levee, flood wall, and retaining wall design, and structures typically associated with levees (pump stations, gate well structures, utility penetrations, stoplog & sandbag gaps, and other closure structures).

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The Upper Susquehanna Comprehensive FDR, NY – FRM Watershed Analysis, Phase I Report is not a decision document that will result in congressional authorization for construction of a project. However, the results and findings will support the scoping activities for Phase II of the feasibility study with more precision towards the likelihood of Federal FRM project implementation.

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.** ATR will occur prior to major decision points in the planning process so that the technical results can be relied upon in setting the course for further study. An in-depth review of the Upper Susquehanna Comprehensive FDR, NY – FRM Watershed Analysis, Phase I report and any appendices (if produced) will be coordinated and documented by the PDT study manager prior to MSC review. It is not anticipated that there will be any key technical products for which interim review will be required. All ATR activities will be coordinated with the FRM Planning Center of Expertise (PCX). The ATR will be accomplished by an independent entity outside the Baltimore District, within the USACE, as designated by the FRM-PCX. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles, and professional practices of all project decision documents. The intent is for an ATR to not only ensure technical analyses are correct, but also ensure compliance with all pertinent USACE guidance early in the study prior to MSC review. ATR will be completed on the following documentation:

- Upper Susquehanna Comprehensive FDR, NY – FRM Watershed Analysis, Phase I Report and Technical Appendices

- b. **Required ATR Team Expertise.** The expertise represented on the ATR team should reflect the significant expertise involved in the work effort and will generally mirror the expertise on the PDT. The expertise that should be brought to the review team may include, but not necessarily limited to, the following:

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 reviewer should have recent experience in reviewing Plan Formulation processes for multi-objective studies and be able to draw on “lessons learned” in advising the PDT of best practices.
Economics	The reviewer should be familiar with the processes used in evaluation of FRM projects and have recent experience in preparing economic analysis plans for FRM feasibility studies. HEC-FDA will be used for analysis.
Environmental Resources	The reviewer should have a solid background in the habitat types and environmental conditions of rural and urban floodplains and streams of the Northeast United States.
Cultural Resources	The reviewer should have extensive USACE experience regarding cultural resources on public and tribal lands. They need to be familiar with Department of Defense as well as USACE policies and procedures as they pertain to USACE studies and projects.
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.
Hydrology and Hydraulic Engineering	The reviewer should carry a Professional Engineer’s license and have the ability at a minimum to address river hydraulics and sediment transport, hydrologic statistics and risk analysis, reservoir system analysis, planning analysis, and real-time water control management.
Geotechnical Engineering	The reviewer should carry a Professional Engineer’s license and have recent experience in USACE design requirements for levee work. This person should also have experience in investigating existing subsurface conditions and materials; determining their physical/mechanical properties that are relevant to the project considered, assessing risks posed by site conditions; and designing earthworks and structure foundations.
Civil Engineering	The reviewer should carry a Professional Engineer’s license and have recent experience in the design and of plans and specifications for levees and river bridges, to include tie in to natural features.

ATR Team Members/Disciplines	Expertise Required
Structural Engineering	The reviewer should carry a Professional Engineer's license and have a thorough understanding of non-structural measures, levee, flood wall, and retaining wall design, and structures typically associated with levees (pump stations, gate well structures, utility penetrations, stop log & sandbag gaps, and other closure structures). A certified professional engineer is recommended though not required.

The ATR Lead should also serve as a reviewer for both Planning and Environmental Resources disciplines. In addition, the Economist should also serve as a reviewer for the Risk Analysis discipline.

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 been 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 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 FRM 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.** An IEPR will not be needed as the Upper Susquehanna Comprehensive FDR, NY – FRM Watershed Analysis, Phase I Report. If and when the feasibility study advances into Phase II, the Review Plan will be updated to undergo Type I IEPR.
- b. **Products to Undergo Type I IEPR.** If an IEPR were to be conducted, it would only be on the full draft feasibility report, including all relevant appendices. A full draft feasibility report and appendices would only be available when the study proceeds into Phase II and is near completion.
- c. **Required Type I IEPR Panel Expertise.** Not applicable in Phase I however an assessment will be made at the conclusion of Phase I about the need for Type I IEPR and a SAR for Phase II and the RP will be appropriately updated.
- 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.c 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 IEPR Final 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 IEPR Final 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 IEPR Final Report and USACE response will be made available to the public, including through electronic means on the internet.

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

The Upper Susquehanna Comprehensive FDR, NY – FRM Watershed Analysis, Phase I report will not include alternatives and will not recommend project construction. Thus, there will be no need for a detailed cost estimate, construction schedules, and contingencies produced by a Cost Engineer or DX review and certification. This section will be updated if Phase II is initiated and a final decision document recommending Congressional authorization is developed.

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 1.2.5 (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 FRM plans using risk-based analysis methods.	Certified

- 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)	HEC-RAS provides the capability to perform one-dimensional steady and unsteady flow river hydraulics calculations. The program will be used for steady flow analysis long the Susquehanna River and its tributaries within the Upper Susquehanna River Basin.	HH&C CoP Preferred Model
Flo-2D	It is a flood routing model that simulates channel flow, unconfined overland flow and street flow over complex topography. It will provide a summary of total inundation area for the existing conditions within the Upper Susquehanna River Basin.	Approved for flood routing and floodplain mapping.

10. REVIEW SCHEDULES AND COSTS

- a. **ATR Schedule and Cost.** The cost and schedule of ATR will be negotiated between the Baltimore District and the FRM-PCX. It is assumed that documents to be reviewed will be transmitted electronically to the assigned ATR members. Comments will be recorded using DrChecks software if technical in nature; otherwise another suitable format will be coordinated with the ATR member. All comments will be provided electronically to the Baltimore District study manager. It is assumed that the ATR team will be working virtually. The ATR team may be asked to participate in IPR meetings via conference calls or video-conference (TBD).
- b. **Type I IEPR Schedule and Cost.** N/A
- c. **Model Certification/Approval Schedule and Cost.** All models are certified or approved for use without further model review.

11. PUBLIC PARTICIPATION. It is anticipated that the project team will hold two (2) meetings to inform the community about the project to get their thoughts and feedback as the project moves along.

12. 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. Minor changes to the review plan since the last MSC Commander approval are documented in Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders’ approval memorandum, will be posted on the North Atlantic Division’s approval Review Plan 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:

- Anthony Clark, Baltimore District
410-962-3413, Anthony.A.Clark@usace.army.mil
- Joseph Vietri, Chief, Planning and Policy Division, North Atlantic Division
718-765-7070, Joseph.R.Vietri@usace.army.mil
- Eric W. Thaut, South Pacific Division
415-503-6852, eric.w.thaut@usace.army.mil

ATTACHMENT 1: TEAM ROSTERS

PDT

Discipline	Name	Email	Phone Number
Project Manager	Kim Gross	Kimberly.U.Gross@usace.army.mil	(410) 962-3457
Lead Plan Formulator	Tony Clark	Anthony.A.Clark@usace.army.mil	(410) 962-3413
Study Manager	Tony Clark	Anthony.A.Clark@usace.army.mil	(410) 962-3413

ATR

Discipline	Name	Email	Phone Number	Credentials	Years of Exp.
ATR Lead	Not Assigned	TBD	TBD	TBD	TBD
Planning	Not Assigned	TBD	TBD	TBD	TBD
Economics	Not Assigned	TBD	TBD	TBD	TBD
Environmental Resources	Not Assigned	TBD	TBD	TBD	TBD
Cultural Resources	Not Assigned	TBD	TBD	TBD	TBD
Risk Analysis	Not Assigned	TBD	TBD	TBD	TBD
Hydraulic and Hydrology Engineering	Not Assigned	TBD	TBD	TBD	TBD
Geotechnical Engineering	Not Assigned	TBD	TBD	TBD	TBD
Civil Engineering	Not Assigned	TBD	TBD	TBD	TBD
Structural Engineering	Not Assigned	TBD	TBD	TBD	TBD

Vertical Team

Title	Name	Email	Phone Number
District Planning Coordinator	Not Assigned	TBD	TBD
PCX - FRM	Eric Thaut	eric.w.thaut@usace.army.mil	415-503-6852
RIT Lead	Not Assigned	TBD	TBD
NAD Division Planning Chief	Joseph Vietri	Joseph.R.Vietri@usace.army.mil	718-765-7070

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 Upper Susquehanna Comprehensive FDR, NY – FRM Watershed Analysis, Phase I. 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 DrCheckssm.

SIGNATURE

Name

ATR Team Leader

Office Symbol/Company

Date

SIGNATURE

Kim Gross

Project Manager

CENAB-PP-C

Date

SIGNATURE

Name

Architect Engineer Project Manager¹

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

Ron Maj

Chief, Engineering Division

CENAB-EN

Date

SIGNATURE

Amy Guise

Chief, Planning Division

CENAB-PL

Date

¹ Only needed if some portion of the ATR was contracted

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

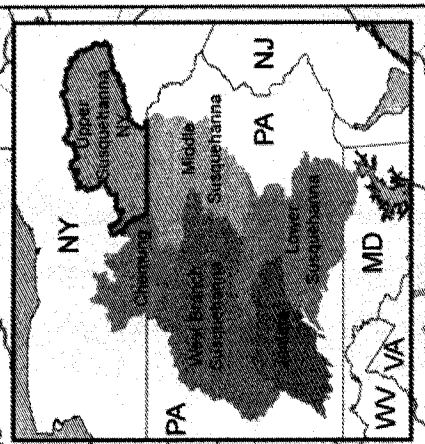
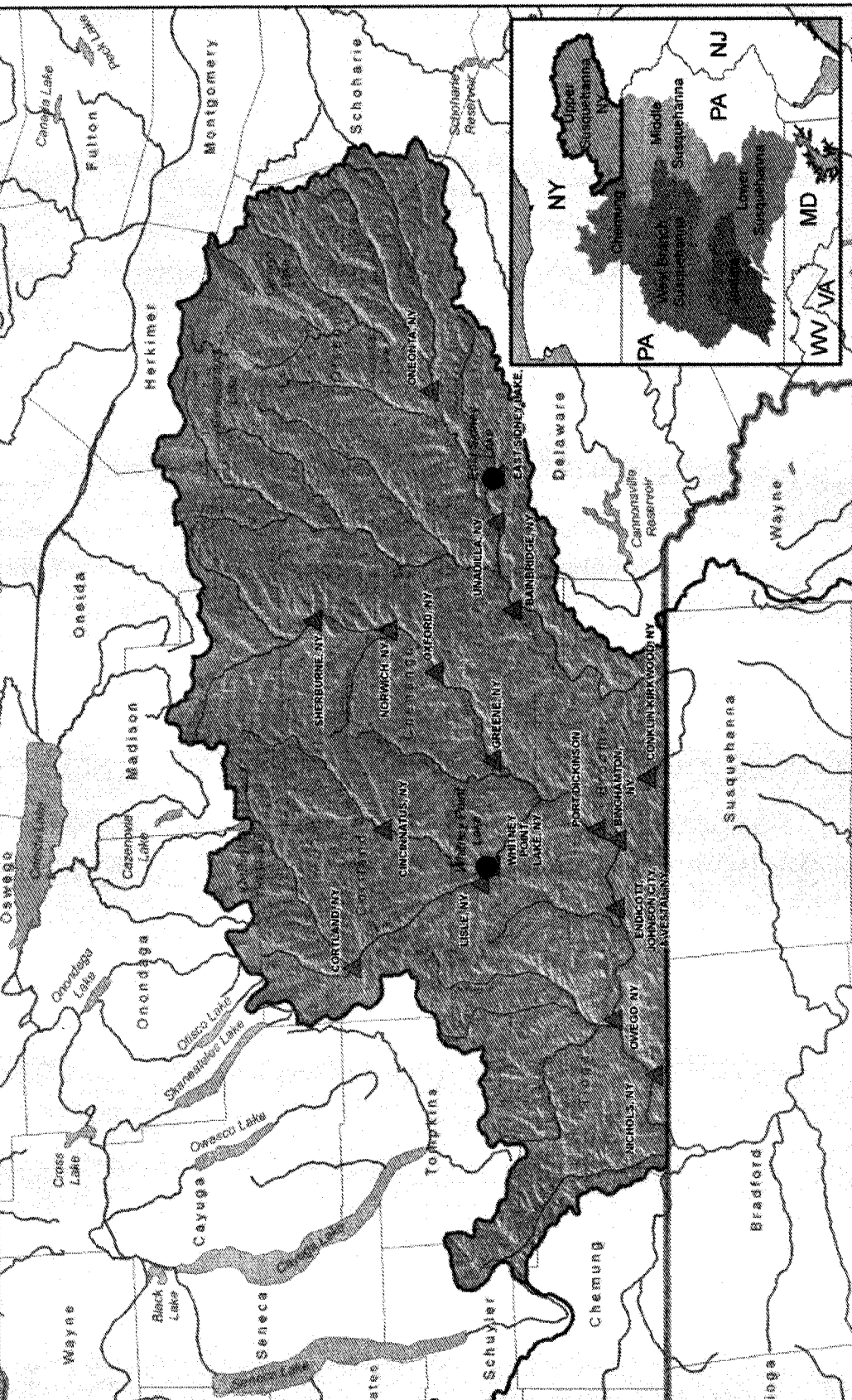
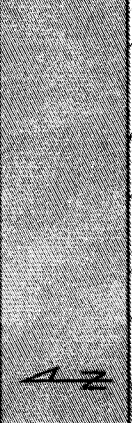
ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

<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
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/MS	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
LRR	Limited Reevaluation Report	USACE	U.S. Army Corps of Engineers
MSC	Major Subordinate Command	WRDA	Water Resources Development Act



US Army Corps
of Engineers
Baltimore District

Existing Water Resource Projects Upper Susquehanna River Basin, New York



Rivers and Streams
 Upper Susquehanna River Basin, NY
 MAB Civil Works Boundary

Lakes
 Counties
 States

Reservoirs
 Flood Control & Snagging & Clearing Projects

17 3.5 0 17 Miles