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

AUG 28 2008

REPLY TO
ATTENTION OF

CENAD-PSD-P

MEMORANDUM FOR Commander, Philadelphia District, ATTN: CENAP-PL

SUBJECT: Review Plan Approval for Upper Delaware River Watershed, Livingston Manor, N.Y. Feasibility Study

1. Reference:

a. EC 1105-2-408, Peer Review of Decision Documents, 31 May 2005.

b. Memorandum, CECW-CP, 30 March 2007, subject: Peer Review Process.

2. The enclosed Review Plan for the Upper Delaware River Watershed, Livingston Manor, N.Y. has been prepared in accordance with the referenced guidance.

3. The Plan has been made available for public comment, and any comments received have been incorporated. It has been coordinated with the Planning Center of Expertise for Flood Risk Management (South Pacific Division). The Plan currently does not include independent external peer review.

4. I hereby approve this Plan, which is subject to change as study circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to this Plan or its execution will require new written approval from this office.

Encl

Joseph R. Vietri
Chief, Planning & Policy Community of Practice
Program Support Division
Programs Directorate

PEER REVIEW PLAN

Upper Delaware River Watershed,
Livingston Manor, New York,
Feasibility Study

Philadelphia District

August 2008

DR

US Army Corps
of Engineers
Philadelphia District

PEER REVIEW PLAN

UPPER DELAWARE RIVER WATERSHED, LIVINGSTON MANOR, NEW YORK, FEASIBILITY STUDY

PHILADELPHIA DISTRICT

1. PURPOSE AND REQUIREMENTS 1
   A. Purpose 1
   B. Requirements 1

2. PROJECT DESCRIPTION 2
   A. Decision Document 2
   B. General Site Description 2
   C. Project Scope 3
   D. Problems and Opportunities 3
   E. Potential Analyses 3
   F. Product Delivery Team 4
   G. Vertical Team 4
   H. Certification of Models 4

3. AGENCY TECHNICAL REVIEW PLAN 5
   A. General 5
   B. Agency Technical Review 5
   C. Communication 5
   D. Funding 6
   E. Timing and Schedule 6
   F. Review Responsibilities 7
   G. Resolution 8
   H. Certification of Technical Review 8
   I. Alternative Formulation Briefing 8

4. EXTERNAL PEER REVIEW PLAN 8
   A. Project Magnitude 9
   B. Project Risk 9
   C. Vertical Team Consensus 9

5. PUBLIC AND AGENCY REVIEW 9

6. PCX COORDINATION 10

7. APPROVALS 10

APPENDICES

Appendix A Peer Review Plan Teams
Appendix B Statement of Technical Review

DRAFT

PEER REVIEW PLAN

UPPER DELAWARE RIVER WATERSHED,
LIVINGSTON MANOR, NEW YORK,
FEASIBILITY STUDY

PHILADELPHIA DISTRICT

1. PURPOSE AND REQUIREMENTS

A. Purpose. This document is the peer review plan for Upper Delaware River Watershed, Livingston Manor, New York, Feasibility Study. Engineering Circular 1105-2-408, dated 31 May 2005 (the Circular) *Peer Review of Decision Documents* requires that documents have a peer review plan and establishes procedures to ensure the quality and credibility of Corps decision documents by adjusting and supplementing the review process. The Circular applies to all feasibility studies and any other reports that lead to decision documents that require authorization by Congress. The feasibility level reports for this project will lead to Congressional Authorization and are therefore covered by the Circular.

B. Requirements. The Circular outlines the requirements of the two review approaches; Agency technical review (ITR) and external peer review (EPR) and provides guidance on Corps Planning Centers of Expertise (PCX) involvement in the peer review process. This document addresses review of the decision document as it pertains to both approaches and planning coordination with the appropriate Center of Expertise.

(1) ITR. Districts are responsible for reviewing the technical aspects of the decision documents through the ITR approach. ITR is a critical examination by a qualified person or team that was not involved in the day-to-day technical work that supports the decision document. ITR is intended to confirm that such work was done in accordance with clearly established professional principles, practices, codes, and criteria. In addition to technical review, documents should also be reviewed for their compliance with laws and policy. The Circular also requires that DrChecks (https://www.projnet.org/projnet/) be used to document all ITR comments, responses, and associated resolution.

(2) EPR. The Circular added external peer review to the existing Corps review process. This approach does not replace the standard ITR process. The external peer review approach applies in special cases where the cost and risk of the project are such that a critical examination by a qualified person or team outside the Corps is necessary. EPR can also be used where the analysis is based on novel methods, presents complex interpretation challenges, contains precedent-setting methods or models, or is likely to affect policy decisions that have a significant impact. The degree of independence required for technical review increases as the project cost and project risk increase.

(a) Projects with low cost and low risk may use a routine ITR.

(b) Projects with either high cost/low risk or low cost/high risk would require both Corps and outside reviewers on the ITR team to address the portions of the project that cause the project to rate high on the cost or risk scale.

(c) Projects with high cost and high risk require a routine ITR as well as an EPR.

(3) PCX Coordination. The Circular outlines PCX coordination in conjunction with preparation of the review plan. Districts should prepare the plans in coordination with the appropriate PCX. Reviews will be assigned to the appropriate Center based on business programs. The Corps PCX are responsible for the accomplishment and quality of ITR and EPR for decision documents covered by the Circular. Centers may conduct the review or manage the review to be conducted by others. The Circular outlines alternative procedures to apply to decision documents. Each Center is required to post peer review plans to its website every three months as well as links to any reports that have been made public. The Office of Water Project Review will consolidate the lists of all peer review plans and establish a mechanism for soliciting public feedback on the peer review plans.

2. PROJECT DESCRIPTION

A. Decision Document. The purpose of the study is to indentify and evaluate Flood Risk Management (FRM) options in the Livingston Manor, New York area utilizing a combination of environmental restoration alternatives and traditional flood risk management measures. Past flood protection studies of the area have not been economically justifiable. The decision document will present planning, engineering, and implementation details of the recommended plan to allow final design and construction to proceed subsequent to the approval of the plan. The analysis is a General Investigations study undertaken to evaluate combinations of structural and non-structural flood risk management measures using environmental restoration options that contribute to flood risk management for three waterways in Livingston Manor; the Little Beaver Kill, Willowemoc Creek and Cattail Brook. The feasibility phase of this project is cost shared 50/50 with the project sponsor, the State of New York, Department of Environmental Conservation.

B. General Site Description. The study area is located at the junction of the Little Beaver Kill and Willowemoc Creeks in the hamlet of Livingston Manor (population 1,482) in the Town of Rockland, Sullivan County, about 76 miles northwest of New York City. Livingston Manor has been flooded five times in the last six years, including three consecutive 100-year recurrence interval events. The main damage area in Livingston Manor consists of residences and businesses situated adjacent to the confluence of the Little Beaver Kill and Willowemoc Creek. Some damage is suffered along the right bank (facing downstream) of Willowemoc Creek during major flood stages, and to the sewage treatment plant on the left bank downstream of the main damage area. Although overbank flows of Willowemoc Creek are relatively rare occurrences, high flows in that stream cause a backwater condition in the Little Beaver Kill, and occasionally Cattail Brook, frequently resulting in overbank flooding of those streams. An additional cause of backwater flooding on Little Beaver Kill is the development adjacent to the Main Street Bridge.

In this area structures have encroached in to the stream, greatly reducing the carrying capacity of the bridge.

C. Project Scope. The study will examine all practicable flood risk management and ecosystem restoration alternatives that will contribute to flood risk management, including structural and non-structural measures. The preliminary estimated total study cost is $1 million.

D. Problems and Opportunities. The primary flood problem in Livingston Manor is the Little Beaver Kill. Flooding of the hamlet center occurs when the Little Beaver Kill overtops its banks along Pearl Street. The Corps has been involved in several studies of flooding in the Livingston Manor area, including reports issued in 1954, 1970 and 1979. However, none of those studies resulted in the construction of any flood control measures, primarily due to cost-benefit considerations. Consultation between various parties resulted in the agreement of the Corps to participate in a study of Flood Risk Management using ecosystem restoration and structural and non-structural flood reduction methods for the hamlet. Among the justifications for the project is the fact that land use changes have occurred since the last Reconnaissance Report. In addition, there are opportunities and a need for ecosystem restoration in the project area. The project area lies within the watershed of the Beaverkill, a nationally-recognized trout fishery. The Little Beaver Kill and Willowemoc Creek are important tributaries. A change in course of the Little Beaver Kill away from its natural streambed into abandoned gravel pits has occurred, which has degraded physical habitat and raised stream temperatures. Thermal conditions on the Little Beaver Kill have been extensively studied by the NYSDEC. Resolution of the thermal problem and other ecological issues involving channel stability, erosion and deposition, and wetland/floodplain losses are also a high priority of the NYSDEC and stakeholder organizations such as The Nature Conservancy and Trout Unlimited.

E. Potential Analyses. The following is a partial list of flood risk management alternatives that will be considered during the feasibility study:

- upstream storm water detention
- removal of structural obstructions to flow (bridges and under-sized hydraulic structures)
- construction of wetlands and additional flood plain areas
- realigned confluence and increased channel capacity
- high flow diversion channel
- environmental enhancement features of existing storm water detention

Unit hydrographs and runoff hydrographs will be developed using HEC-HMS software. The team will review existing hydrologic data and technical reports developed for the study area and streams of interest. Existing hydrologic data for the study area is contained in the FIS for the Town of Rockland dated December 1987. The FIS documents that peak discharges for the 10-, 50-, 100-, and 500-year floods for Willowemoc Creek and the Little Beaver Kill were computed using a regional method developed by the USGS and flood-frequency analyses of gauging station records. Cattail Brook discharges were estimated using regional regression equations for New York State. Updated hydraulic data for the watercourses in Livingston Manor have been prepared by the USGS following significant floods in 1996, 1999, 2004 and 2006.

To quantify existing fish and wildlife habitat values, as well as the impact that erosion and floodwaters have had on the wildlife and fishery populations, a technique known as the Habitat Evaluation Procedure (HEP) will be used. The objective of HEP is to express fish and wildlife habitat conditions in quantitative terms so that changes may be measured and compared. This is accomplished with habitat units (HUs). Subtotals and totals of habitat units provide a basis for comparing different areas or a single area at different points in time. HEP was developed by the U.S. Fish and Wildlife Service (F&WS) in the early 1970's. HEP was developed as an approach to a nonmonetary evaluation procedure for use in planning projects. The F&WS describes HEP in the following way:

HEP is a procedure that is based on the assumptions that habitat for selected wildlife species can be described by a Habitat Suitability Index (HSI). This index value (from 0.0 to 1.0) is multiplied by the area of available habitat to obtain Habitat Units (HU's), which are used in the comparisons described above. The reliability of HEP and the significance of HU's are directly dependent on the availability of the user to assign a well defined and accurate HSI to the selected evaluation species. With HEP, the geographical area of interest is defined by members of an interagency team; maps of the area are prepared to depict the various land uses/cover types that are evident on aerial photographs; acreage of the land use/cover types are estimated by planimetry of the maps; the current value of each cover type for each of several species of vertebrate animals is assessed in the field by team members using word models of species/habitat relationships; and resulting numerical ratings are multiplied by appropriate acreage values to yield "habitat units" - indices of both the quantity and quality of habitat for terrestrial and aquatic wildlife.

Future with-project conditions are likewise assessed from assumed future conditions and contrasted with the baseline. The resulting changes, either increases or reductions in habitat units, constitute wildlife impacts. This process can be used for this study to identify past, present, and future habitat values, as well as changes associated with a proposed project. For this study, a HEP report will be prepared based on available models of species which frequent and inhabit the Livingston Manor project area.

F. Product Delivery Team. The product delivery team (PDT) is comprised of those individuals directly involved in the development of the decision document. Individual contact information and disciplines are presented in appendix A.

G. Vertical Team. The Vertical Team includes District management, North Atlantic Division's District Support Team (DST) and Regional Integration Team (RIT) staff as well as members of the Planning Community of Practice (PCoP). Specific points of contact for the Vertical Team can be found in appendix A.

H. Certification of Models. The *computational models* to be employed in the Livingston Manor Feasibility Study have either been developed by or for the USACE. Models to be employed in the conduct of this feasibility study are:

- MCACES: This is a cost estimating model that was developed by Building Systems Design Inc. The Army Corps of Engineers began using this model in 1989.

- HEC-FDA: This model, developed by the Corps' Hydrological Engineering Center, will assist the PDT in applying risk analysis methods for flood damage reduction studies as required by, EM 1110-2-1419. This program:
  - Provides a repository for both the economic and hydrologic data required for the analysis
  - Provides the tools needed to understand the results
  - Calculates the Expected Annual Damages and the Equivalent Annual Damages
  - Computes the Annual Exceedence Probability and the Conditional Non-Exceedence Probability
  - Implements the risk-based analysis procedures contained in EM 1110-2-1619

- HEC-RAS: The function of this model is to complete one-dimensional hydraulic calculations for a full network of natural and man made channels. HEC-RAS major capabilities are:
  - User interface
  - Hydraulic Analysis
  - Data storage and Management
  - Graphics and reporting

- HEC-HMS: By applying this model the PDT is able to:
  - Define the watersheds' physical features
  - Describe the metrological conditions
  - Estimate parameters
  - Calculate storm runoff hydrographs
  - Obtain GIS connectivity

- HSI: The HSI ecosystem models have not yet been selected, but will be coordinated with the ECO-PCX upon identification.

Model certification and approval for all identified planning models will be coordinated through the PCX as needed. Project schedules and resources will be adjusted to address this process for certification and PCX coordination.

3. AGENCY TECHNICAL REVIEW PLAN

As required in the Circular, the District is responsible for ensuring adequate technical review of decision documents. The responsible PDT District of this decision document is Philadelphia (NAP). It is recommended that the Flood Risk Management PCX nominate individuals to serve as the peer review team.

A. General. An ITR Manager shall be designated for the ITR process. The proposed ITR Manager for this project is To Be Determined (TBD). The ITR Manager is responsible for providing information necessary for setting up the review, communicating with the Study Manager, providing a summary of critical review comments, collecting grammatical and editorial comments from the ITR team (ITRT), ensuring that the ITRT has adequate funding to

perform the review, facilitating the resolution of the comments, and certifying that the ITR has been conducted and resolved in accordance with policy.

B. ITR Team (ITRT). The ITRT will be comprised of individuals that have not been involved in the development of the decision document and will be chosen based on expertise, experience, and/or skills. The members will roughly mirror the composition of the PDT in technical specialties. It is anticipated that the team will consist of 9-11 reviewers. The ITRT members will be identified at the time the review is conducted and will be presented in appendix A. The Cost Engineering ITR will be coordinated with the Cost Engineering DX at Walla Walla District.

C. Communication. The communication plan for the ITR is as follows:

(1) The team will use DrChecks to document the ITR process. The Study Manager will facilitate the creation of a project portfolio in the system to allow access by all PDT and ITRT members. An electronic version of the document, appendices, and any significant and relevant public comments shall be posted in Word format at: ftp://ftp.usace.army.mil/usace/ at least one business day prior to the start of the comment period.

(2) The PDT shall send the ITR manager one hard copy (with color pages as applicable) of the document and appendices for each ITRT member such that the copies are received at least one business day prior to the start of the comment period.

(3) The PDT shall host an ITR kick-off meeting virtually to orient the ITRT during the first week of the comment period. The PDT shall provide a presentation about the project, including photos of the site, for the team.

(4) The Study Manager shall inform the ITR manager when all responses have been entered into DrChecks and conduct a briefing to summarize comment responses to highlight any areas of disagreement.

(5) A revised electronic version of the report and appendices with comments incorporated shall be posted at ftp://ftp.usace.army.mil/usace/ for use during back checking of the comments.

(6) Team members shall contact ITRT members or leader as appropriate to seek clarification of a comment's intent or provide clarification of information in the report. Discussions shall occur outside of DrChecks but a summary of discussions may be provided in the system.

(7) Reviewers will be encouraged to contact PDT members directly via email or phone to clarify any confusion. DrChecks shall not be used to post questions needed for clarification.

(8) The ITRT, the PDT, and the vertical team shall conduct an after action review (AAR) no later than 2 weeks after the policy guidance memo is received from HQUSACE for the for the AFB and draft reports.

D. Funding

(1) The PDT district shall provide labor funding by cross charge labor codes. If needed, funding for travel will be provided through government order. The Study Manager will work

with the ITR manager to ensure that adequate funding is available and is commensurate with the level of review needed. The current cost estimate for this review is $30,000. Any funding shortages will be negotiated on a case by case basis and in advance of a negative charge occurring.

(2) The Study Manager shall provide organization codes for each team members and a responsible financial point of contact (CEFMS responsible employee) for creation of labor codes.

(3) Reviewers shall monitor individual labor code balances and alert the ITRT Study Manager to any possible funding shortages.

E. Timing and Schedule.

(1) Throughout the development of the decision document, the team will hold planning charrettes to ensure planning quality. Senior staff and subject matter experts from the PDT District and members of the vertical team (DST, Planning CoP, and RIT as needed) will attend the charrettes and provide comments on the product to date.

(2) The PDT will hold a "page-turn" session to review the draft report to ensure consistency across the disciplines and resolve any issues prior to the start of ITR. Writer/editor services will be performed on the draft prior to ITR as well.

(3) The ITR will begin once a recommended plan has been selected, the preliminary design is complete, and the environmental assessment has been performed.

(4) The ITR process for this document will follow the timeline below. Actual dates will be scheduled once the period draws closer. It is estimated that review of the report will be begin in the 4th Quarter of FY 2009.

Task	Date
ITR of Draft Report Comment Period	Begin Week 1
Kickoff meeting	Week 1
ITR Comments	Due Week 4
PDT Responses	Due Week 6
Responses Backcheck	Week 8
Alternative Formulation Briefing (AFB)	Week 14
AFB Policy Memo Issued	Week 18
ITR Interim Certification	Week 18
Draft Report Complete	Week 20
ITR After Action Review	NLT Week 20
Public Review of Draft Report	Begin Week 25
ITR Certification/Completion	Week 32
Final Report	Completed Week 40

F. Review Responsibilities.

(1) ITRT responsibilities are as follows:

(a) Reviewers shall review the draft report to confirm that work was done in accordance with established professional principles, practices, codes, and criteria and for compliance with laws and policy. Comments on the report shall be submitted into DrChecks.

(b) Reviewers shall pay particular attention to one's discipline but may also comment on other aspects as appropriate. Reviewers that do not have any significant comments pertaining to their assigned discipline shall provide a comment stating this.

(c) Grammatical and editorial comments shall not be submitted into DrChecks. Comments should be submitted to the ITR manager via electronic mail using tracked changes feature in the Word document or as a hard copy mark-up. The ITR manager shall provide these comments to the Study Manager.

(d) Review comments shall contain these principal elements:

- a clear statement of the concern
- the basis for the concern, such as law, policy, or guidance
- significance for the concern
- specific actions needed to resolve the comment

(e) The "Critical" comment flag in DrChecks shall not be used unless the comment is discussed with the ITR manager and/or the Study Manager first.

(2) PDT Team responsibilities are as follows:

(a) The team shall review comments provided by the ITRT in DrChecks and provide responses to each comment using "*Concur*, *Non-Concur*" or "*For Information Only*". *Concur* responses shall state what action was taken and provide revised text from the report if applicable. *Non-Concur* responses shall state the basis for the disagreement or clarification of the concern and suggest actions to negotiate the closure of the comment.

(b) Team members shall contact the PDT and ITRT managers to discuss any "*Non-Concur*" responses prior to submission.

G. Resolution.

(1) Reviewers shall back check PDT responses to the review comments and either close the comment or attempt to resolve any disagreements. Conference calls shall be used to resolve any conflicting comments and responses.

(2) Reviewers may "agree to disagree" with any comment response and close the comment with a detailed explanation. If reviewer and responder cannot resolve a comment, it should be brought to the attention of the ITR manager and, if not resolved by the ITR manager, it should be brought to the attention of the planning chief who will need to sign the certification. ITRT members shall keep the ITR manager informed of problematic comments. The vertical team will be informed of any policy variations or other issues that may cause concern during HQ review.

H. Certification of Technical Review.

To fully document the ITR process, a statement of technical review will be prepared. Certification by the ITR manager and the Study Manager will occur once issues raised by the reviewers have been addressed to the review team's satisfaction and the final report is ready for submission for HQ review. Indication of this concurrence will be documented by the signing of a certification statement (Appendix B). A summary report of all comments and responses will follow the statement and accompany the report throughout the report approval process. An interim certification will be provided by the ITR team lead to indicate concurrence with the report to date until the final certification is performed when the report is considered final.

I. Alternative Formulation Briefing (AFB).

The AFB for this project will occur after the majority of the ITR comments have been resolved. It is possible that the briefing will result in additional technical or policy comments from high level reviewers for resolution. The resolution of significant policy comments may result in major changes to the document. Therefore, the ITR team lead will perform a brief review of the report to ensure that technical issues are resolved.

4. EXTERNAL PEER REVIEW PLAN

This decision document will present the details of a feasibility study undertaken to evaluate damage reduction measures using structural and non-structural means and environmental restoration measures in Livingston Manor, New York as described in paragraph 2 above. This project does not meet the EPR standards outlined in the Circular.

A. Project Cost. The cost of this project is determined as low. The cost of the project will not exceed $15 million. The scale of the project is limited because the project construction footprint will be limited because many of the features involve removal of obstructions and improvement to existing structures. The project is not considered complex and involves implementation of standard concepts. It is anticipated that the report will not present influential scientific information or influential scientific assessments, thus only an ITR is anticipated to be required.

B. Project Risk. This project is considered low risk overall. The potential for unexpected failure is low because the project involves straight forward concepts with numerous successful national applications. The potential for controversy regarding project implementation is low because the recommended plan will take into account the public concerns. A socio-economic analysis will be prepared and at least one public meeting will be held. The uncertainty of success

of the project is low because the methods used for evaluating the project are standard and the concept of implementing proposed project features is not innovative.

C. Vertical Team Consensus. This peer review plan will serve as the coordination document to obtain vertical team consensus. Subsequent to PCX approval, the plan will be provided to the vertical team for approval. MSC approval of the plan will indicate vertical team consensus.

A separate EPR will not be conducted on the decision document and external members will not be part of the ITR team. The ITR and Public and Agency Review will serve as the main review approaches.

5. PUBLIC AND AGENCY REVIEW

- Public involvement in the study process will be initiated after the Feasibility Scoping Meeting to confirm the study is on the right track.

- Public review of the draft report will occur after issuance of the AFB policy guidance memo and concurrence by 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.

- Public review of the draft report will begin approximately 1 month after the completion of the ITR process and policy guidance memo and will last a minimum of 60 days to ensure NEPA compliance.

- Public review of necessary state or Federal permits will also take place during this 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 concurrent with the planning process.

- Upon completion of the review period, comments will be consolidated in a matrix 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 document.

6. PCX COORDINATION

The lead PCX for this document is the National Flood Risk Management Center of Expertise located at SPD. This review plan will be submitted to the FRM-PCX Director, Eric Thaut, for approval. The document will also be coordinated with the ECO-PCX since it will include environmental restoration measures that contribute to flood risk management. An EPR will not be required because this project is considered low magnitude and low risk. As such, the FRM-PCX will not be asked to manage the review, but is requested to nominate the ITR team as discussed in paragraph 3.b. above. The approved review plan will be posted to the FRM-PCX

website. Any public comments on the review plan will be collected by the Office of Water Project Review (OWPR) and provided to the District PDT for resolution and incorporation if needed.

7. APPROVALS

The PDT will carry out the review plan as described. The Study Manager will submit the plan to the PDT District Planning Chief for approval. Coordination with PCX will occur through the PDT District Planning Chief. Signatures by the individuals listed in Appendix B will certify that the review was completed