



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 5 2012

CENAD-PD-PP

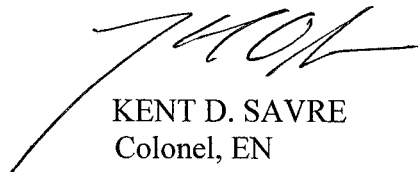
DEC 5 2012

MEMORANDUM FOR Commander, Baltimore District, ATTN: CENAB-PP-C

SUBJECT: Review Plan Approval for Lower Susquehanna River Watershed Assessment

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 Ecosystem Planning Center of Expertise of the Mississippi Valley Division, which is the lead office to execute this plan. For further information, contact Ms. Jodi Creswell at 309-794-5448. As no specific projects for construction will be evaluated for this Corps-led watershed assessment, the Review Plan does not include independent external peer review, as it is not applicable to this effort.
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  
as

  
KENT D. SAVRE  
Colonel, EN  
Commanding

**REVIEW PLAN**

**Lower Susquehanna River Watershed Assessment**  
**Baltimore District**

**MSC Approval Date: Pending**  
**Last Revision Date: NONE**



**US Army Corps  
of Engineers** ®

**REVIEW PLAN**

*Lower Susquehanna River Watershed Assessment*

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## 1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the Lower Susquehanna River Watershed Assessment, Maryland and Pennsylvania.

### 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 (PMP) for study
- (6) NAB 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 the National Ecosystem Planning Center of Expertise (ECO-PCX).

The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review team. The Assessment will not have detailed cost estimates, construction schedules and contingencies, it will have planning level costs; therefore, it is anticipated that the Cost DX will not be required to review the Assessment.

## 3. STUDY INFORMATION

a. **Watershed Assessment.** The Lower Susquehanna River Watershed Assessment (Assessment) will serve as a useful and important tool to investigate structural and non-structural strategies for sediment reduction and habitat restoration. Sediment has been identified as one of the primary pollutants in Chesapeake Bay. This assessment will provide information and tools to the State of Maryland and the Chesapeake Bay community as they determine the best methods to reduce sediment inputs to the Bay and to meet the U.S. Environmental Protection Agency (EPA)-mandated Total Maximum Daily Loads (TMDL). The assessment utilizes various watershed-level models to characterize very complex relationships between river flow/sediment and ecological resources in the Lower Susquehanna River system and in the Chesapeake Bay. These include complex and state-

of-the-art river flow and sediment transport models, reservoir models, and environmental models to evaluate Bay water quality and living resources. The Assessment will not require action by Congress. Upon completion of the Assessment, the report will be submitted to the appropriate HQUSACE RIT, which will forward the submittal package to CECW-PC for Policy and legal compliance review. HQ review role will be to ascertain that appropriate considerations have been made and that conclusions are consistent with overall USACE policy and the Chief, Planning and Policy Division, HQUSACE, will approve the final document. Once this review is complete; the appropriate RIT will coordinate the report with ASA for transmittal to congress for information in response to study authority. There will be no National Environmental Policy Act (NEPA) documentation developed in conjunction with this Assessment. NEPA documentation will be developed for future, more detailed analyses and/or recommendations, as warranted.

In determining sediment loads entering the reservoir system, USACE scientists will work closely with watershed practitioners to ensure that proper and coordinated assumptions are made regarding efforts to reduce sediment loads from the land. These are being developed by others as part of Watershed Implementation Plans, pursuant to the TMDL requirements under the Clean Water Act and Chesapeake Bay commitments of the states.

The underlying assumptions of how much sediment enters into the system will be based on ongoing and extensive watershed implementation planning now underway by all six Chesapeake Bay states and the EPA. Their Watershed Implementation Plans (WIP) will lay out land-based management measures such that sediment run-off is limited to that allowable by the defined TMDL. This study is a necessary link and will parlay with these activities. It will use the assumptions of sediment delivery rates from the land to complete the systems evaluation of the ultimate fate of existing and future sediments on the Chesapeake Bay. Understanding the impacts of various management scenarios on the ecological resources of the Lower Susquehanna River and Chesapeake Bay will be key to providing informed choices for decision-makers.

**b. Study/Project Description.** The Susquehanna River provides 48% of the freshwater to the Chesapeake Bay drains an area of 27,510 square miles and is one of the most flood prone rivers in the United States. Near the mouth of the Susquehanna River, where it discharges into the Upper Chesapeake Bay, there are a series of four privately-owned hydropower dams. By trapping sediment and pollutants upstream, these dams play an integral function to reduce adverse impacts to the Bay (Figure 1).

USACE, through the Commander, North Atlantic Division, is the Federal Commissioner on the Susquehanna River Basin Commission (SRBC). The SRBC updated their Comprehensive Plan in 2009, and cited in the actions to, "Identify and garner support for a study of the sediment behind the hydro-electric dams along the lower Susquehanna River and development of Regional Sediment Management Plan to result in the signing of a feasibility cost-sharing agreement." As sediment (and associated nutrients) accumulates in the reservoirs, there is increasing risk that it will be mobilized and cause adverse impacts to the Chesapeake Bay, the largest estuary in the United States, and could devastate restoration efforts to date. Tropical Storm Agnes in 1972 was responsible for the loss of almost 2/3 of the submerged aquatic vegetation (SAV) in the Upper Chesapeake Bay in the early 1970s due to the delivery of 14 years worth of sediment in a matter of days (US Geological Survey (USGS) estimate). It is estimated that 70% of this material was scoured from the reservoirs. It is well documented that excess suspended sediment is one of the leading causes of the Chesapeake Bay's poor health.

Per President Obama's Executive Order (EO) 13508, Chesapeake Bay Protection and Restoration (May 2009), Federal agencies share a renewed commitment to restore the Bay. This EO established the Federal Leadership Committee, on which Ms. Darcy, Civil Works, Assistant Secretary of the Army, ASA (CW), represents USACE and through which the Fiscal Year (FY11) Federal Action Strategy was endorsed. The FY11 Action Strategy conveyed the efforts the Federal government planned to undertake from October 1, 2010, through September 30, 2011. This document (<http://executiveorder.chesapeakebay.net/>) specifically assigned USACE as the "lead" role to, among other actions, "advance studies to evaluate the management of sediments behind Conowingo Dam and from within the watershed," and strengthen science "to better address EO goals through coordination of the federal science capabilities of National Oceanic and Atmospheric Administration, (NOAA), USGS, US Fish and Wildlife Service (FWS), National Park Service (NPS), and USACE." The strategy recognized that ecosystem-based management requires sophisticated, integrated, system-wide collaboration and computer models to enhance decision-making for all the goals therein.

USACE received study authority from the U.S. Senate Committee on Environment and Public Works dated 23 May 2001 – Chesapeake Bay Shoreline Erosion and received appropriations from the fiscal year 2002 Energy and Water Appropriations conference report and the 2009 Omnibus Appropriations Act (House Appropriations Committee Print, H.R. Public Law 111-8) to sign a Feasibility Cost-Sharing Agreement (FCSA) with a non-federal sponsor to "examine management measures that could be undertaken to address the sediments behind the dams on the Lower Susquehanna River."

In October 2009 USACE reconvened the Sediment Task Force (STF) to reinvestigate this issue and generate interest among potential sponsors to sign a cost-sharing agreement to conduct a feasibility study. The STF was originally assembled in 1999 and consisted of stakeholders including various state, federal, and local governments, business, and non-Governmental organizational entities. The STF was tasked with providing policy recommendations to resolve this issue. One of the recommendations was to conduct a feasibility study but there was no sponsor at the time. The 2009 STF meeting generated interest in several sponsors and in 2010 an interagency team was formed to determine the best way to tackle this issue and they have been actively involved in the study scoping activities to date. The Maryland Department of the Environment (MDE) agreed to sign a cost-sharing agreement (75/25) with USACE to be the project sponsor.

Due to the complexity of this issue and the study authority language to "examine management measures," the consensus of the interagency team was to conduct a watershed assessment vs. conducting a traditional feasibility study leading to construction. The Assessment will be a useful and important tool to assist the state in gaining a better understanding of (1) the impact to Chesapeake Bay of sediment transported from the Susquehanna River under various scenarios, (2) the benefits of maintaining sediment storage capacity behind the dams on the Lower Susquehanna River and (3) the most effective strategies that would reduce or maintain the level of sediment and associated nutrient delivery to the Bay.

Upland and riverine strategies are measures that reduce incoming sediment and associated nutrient loads and in-reservoir strategies are those that remove sediment and associated nutrient loads already in the reservoir. The interagency team agreed that the ongoing Bay TMDL efforts and coordinating WIPs will be critical components of the analyses. The Bay TMDL (nutrient and sediment limits) and WIPs (implementation plans to meet limits) are an effort by EPA and

surrounding Bay states to develop implementation plans to limit nutrient and sediment inputs (from the watershed) to the Bay; full implementation of management measures to meet established limits is expected by 2025. The Assessment will evaluate various scenarios assuming full and partial implementation and effectiveness of the WIPs. The projected loads from the TMDL will be incorporated into this Assessment.

The in-reservoir strategies to be addressed in this Assessment include (but are not limited too) sediment by-passing; dredging/innovative re-use; and modifying dam operations. The Assessment will also forecast and describe potential effects of the Conowingo dam filling with sediment that is reaching steady state (i.e. if no actions are taken to address problems). This Assessment will include modeling activities, data gathering, and conceptual (schematic) strategy development with conceptual costs. Conceptual plans will provide enough level of detail to compare costs and benefits if implemented. This Assessment will be coordinated with stakeholders. It will not make any general or site-specific project recommendations. Any conclusions of the Assessment and the ongoing efforts, assumptions and work products will be considered by the STF, and other interested groups and agencies. It is anticipated that the STF will be reconvened as appropriate during the assessment effort. The Assessment will generate a foundational analysis of sedimentation processes in the Lower Susquehanna River and upper Chesapeake Bay and the costs and benefits of various sediment strategies. Any desire by the sponsor to implement any of these strategies with USACE will require additional funding, formal partnerships, and work beyond the scope of this Assessment.

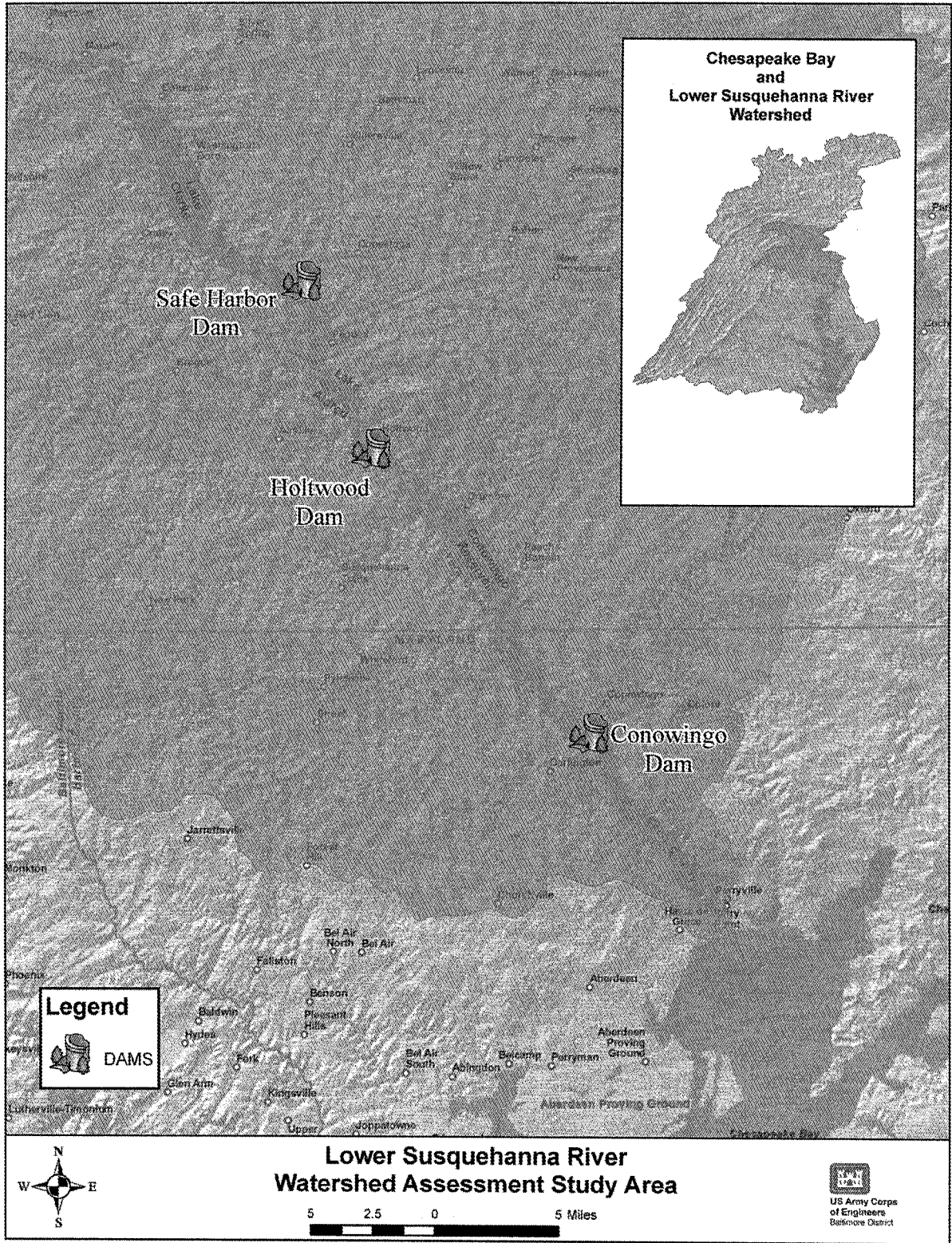


Figure 1-Lower Susquehanna River Watershed Assessment Study Area.



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

- The Assessment will contain conceptual costs and/or ranges of costs for various sediment strategies but will not contain detailed cost estimates using the Corps' Tri-Service Automated Cost Engineering System (TRACES) for individual recommended sites;
- The Assessment will not be making any recommendations for Federal Action; a NEPA document will not be prepared;
- Sediment strategies will not have a direct impact on, or require any modifications of, any of the dams along the Susquehanna River and so they will not involve life safety issues or have a relevant impact on life safety, therefore Type II IEPR will not be required;
- There is no request by the Governor of Maryland or Pennsylvania for a peer review by independent experts; costs do not exceed \$45 million, and there will be no novel or controversial actions involved; therefore Type I IEPR is not triggered.
- The Assessment may include dredging scenarios, dredging placement sites, sediment bypassing, innovative re-use, operational/flow modifications, and other options, but without detailed designs or site-specific recommended plans, LERRDs, and construction considerations;
- MDE is the sponsor for the study; however, MD Department of Natural Resources (MD DNR), MD Geologic Survey (MGS), USGS, The Nature Conservancy (TNC), and SRBC will be part of the interagency team, making decisions for the Assessment and the STF will be used as appropriate to verify decisions or to judge acceptability;
- A model comparison study will be conducted early on in the study to determine if a two dimensional (2D) hydrodynamic and sediment transport model is appropriate to adequately simulate long term sedimentation processes in Conowingo Reservoir or if a three dimensional (3D) model will be necessary. If the 2D model adequately simulates sedimentation processes then the 3D model will not need to be utilized. The assumption at this time is that the 2D ADH model will be sufficient, and is an HH&C CoP Preferred Model. If this is not the case the PMP and review plan will be updated;
- The STF will be coordinated with during this Assessment to provide input and review of technical products developed;
- There is public interest/concern about the issue of sediment build-up behind the dams because of the implications it raises with respect to nutrient and sediment loads to the Chesapeake Bay and management of those loads; more specifically implications to the current development of the Chesapeake Bay TMDL by the EPA in conjunction with surrounding Bay states. EPA has determined that a large influencing factor in sediment and nutrient loads to the Bay is when the dams on the lower Susquehanna no longer function to trap sediment. EPA's intention is to assume the current dam trapping capacity will continue through the TMDL implementation horizon (through 2025). However, if future monitoring shows the trapping capacity of the dam is reduced, then EPA will consider adjusting the Pennsylvania, Maryland and New York sediment and nutrient load allocations based on the new delivered loads to determine if the states are meeting their target load obligations. EPA has stated that it is imperative to the states to

determine how to keep the dams on lower Susquehanna acting as sediment and associated nutrient traps to meet the Bay TMDL and protect the aquatic resources of the Chesapeake Bay;

- There is public interest/concern about the issue of sediment build-up behind the dams due to the potential for a catastrophic or episodic flooding events (such as the 1972 Agnes Storm), which can scour additional sediment from behind the dams on the lower Susquehanna River and result in a load which shocks the Bay ecosystem.

d. **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:

- Input into selection and development of sediment strategies and screening of management strategies;
- Review of modeling results, collected field data, and Assessment report;
- Meeting Attendance;
- Conducting sediment sampling in the Susquehanna Flats;
- Collecting water quality, sediment, and nutrient samples at Conowingo Dam River Input station and providing analysis;
- Review and incorporation of Exelon (owner and operator of Conowingo dam) study results (Exelon is currently conducting several studies at the request of various resource agencies as required through the dam relicensing process that are related to this study) into this Assessment;
- Coordination with EPA and Bay states, integrating TMDL efforts/WIPS/changes into this Assessment; and
- Management of data collection contracts and tracking of non-federal match activities.

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

All decision documents (including supporting data, analyses, 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 Division.

a. **Documentation of DQC.** DQC is documented in a quality control review report (QCRR), which summarizes the reviewed product, review process, and major issues and their resolution. This QCRR, signed by the project delivery team (PDT) and the DQC team will be provided to the ATR team. The DQC process is outlined in the "Planning Division, Civil Project Development Branch, Quality Management Plan" from Baltimore District dated 7 October, 2009.

- b. **Products to Undergo DQC.** The Assessment and its supporting documentation including any in-kind products will undergo DQC.
- c. **Required DQC Expertise.** DQC will be conducted by individuals on the interagency study team as well as peers not affiliated with the Assessment and supervisors.

**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 Division.

- a. **Products to Undergo ATR.** ATR is anticipated for the Draft and Final Assessment. Once ATR is satisfied, the document will be submitted to the MSC for approval. The ATR will include any technical investigations that were completed as part of the Assessment. If an In-Progress Review meeting is required, ATR of read ahead materials may be required. This is not considered likely, however. Further, review of the final document is anticipated to be truncated since it will likely be merely a back check.
- 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. Given the scope and nature of this Assessment, reviews with expertise across more than one discipline will be engaged where possible to limit the size and cost of the ATR effort

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works 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.
Planning	The Planning reviewer should be a senior water resources planner with experience in Watershed Assessments and Plans. Preferable experience also in reservoir sedimentation and land use management.
Civil Engineer/Operations	The civil engineering or Operations reviewer must have experience with watershed assessments and sedimentation, preferable experience with dredging and placement as well as by-passing
Hydrology and Hydraulic Modeling	The hydrology and hydraulic modeling reviewer should be familiar with standard hydrologic and hydraulic modeling, sediment transport, reservoir, and riverine sedimentation and their

	applications to ecosystem functions to aid in decision making.
Environmental	The environmental reviewer should be well versed on ecosystems and aquatic life response to sediment and nutrients.

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 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, 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.** The relevant guidance on IEPR is EC 1165-2-209. Within this guidance four factors are listed to determine whether IEPR is appropriate for the document under consideration. Table 1 summarizes these trigger and a discussion on each point is below:

<b>Table 1. Mandatory Triggers</b>	<b>Yes</b>	<b>No</b>
Significant threat to human life		<b>X</b>
Exceeds \$45 million		<b>X</b>
Governors Request		<b>X</b>
Controversial by DCW		<b>X</b>

(1) Significant threat to human life. The Assessment does not impact a structure or feature of a structure whose performance involves potential life safety risks.

- (2) The watershed assessment has a study cost of \$1.4M and no investments of public monies are required beyond the study cost.
- (3) No governor has requested IEPR.
- (4) There is no controversy surrounding Federal actions associated with this work product. The watershed assessment relies on the best available scientific information, opinion, and consensus.

Guidance also indicates other triggers that may influence the need for IEPR. These are listed in Table 2 and are discussed below.

<b>Table 2. Additional Triggers</b>	<b>Yes</b>	<b>No</b>
EIS		<b>X</b>
Impacts tribal/cultural/historic		<b>X</b>
Impacts on Fish & Wildlife		<b>X</b>
Endangered Species Act impacts		<b>X</b>

The watershed assessment will not lead to project implementation and does not require NEPA documentation. Study products may inform future feasibility or implementation documents. If subsequent studies are undertaken NEPA documentation will be undertaken during those study processes.

This project does not trigger any of the requirements contained in Table 1 or 2.

North Atlantic Division has determined that a request for a Type I IEPR exclusion is premature and that no Type I IEPR should be planned at this time. Should any of the aforementioned triggers change, then a risk-informed decision under current Crops policy regarding the conduct of IEPR would then be evaluated.

- b. Products to Undergo Type I IEPR. None**
- c. Required Type I IEPR Panel Expertise. None**
- d. Documentation of Type I IEPR. None**

**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 Type I IEPR team (if required) 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. Detailed cost estimates will not be prepared as part of this Assessment. Generic or planning-level cost information may be used to help determine future courses of action. The District, in coordination with the RMO, will seek DX guidance as to the appropriate level of review. Certification will not be required.

**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).

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

None.

**a. 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
Chesapeake Bay Program (CBP) Chesapeake Bay Environmental Model package	CBEMP has been used for more than twenty years as a tool for examining the effect of nutrients and solids loads on Bay water quality and living resources. The components of the CBEMP are engineering models. The core of the CBEMP consists of the CH3D hydrodynamic model, which computes transport processes in three dimensions, and the ICM (Integrated Compartment Model) water quality model, which computes water quality and living resources. ICM incorporates representations of estuarine carbon, nutrient, and oxygen cycling as well as living resources	HSPF – HH&C CoP Allowed for Use.

(CBEMP)	such as SAV, filter feeders, and menhaden. The most recent application of ICM to Chesapeake Bay includes a predictive sediment transport model for four classes of sediments: fine clay, clay, silt, and sand. The model operates on a 50,000 cell three-dimensional grid and has been applied to the period 1985-2005. This is the model that has been used to aid in development of the 2010 set of TMDL's for Chesapeake Bay. This package will be used to examine the effect of solids and nutrient loads projected to flow from the Susquehanna River as a result of multiple scenarios including various sediment strategies. The sediment and hydrodynamic projections will be provided by an application of the Adaptive Hydrodynamics Model (ADH) and HEC-RAS models to the three reservoirs above Conowingo Dam. Effects on light attenuation, SAV, chlorophyll, nutrients, and dissolved oxygen will be computed and compared between selected sediment management measures.	
HSPF – EPA Bay Program Watershed Model (WSM)	Calculates nutrient and sediment loads from the watershed at all locations in the Chesapeake Bay. This program will be used to provide loads from the watershed at key locations in the reservoir system;	HSPF – HH&C CoP Allowed for Use.
2D Adaptive Hydraulics (AdH)	Developed by the ERDCWES this numerical model is a finite element implicit scheme model utilizing an unstructured mesh. It provides a fully unsteady solution of system hydrodynamics and sediment transport. <a href="http://chl.erd.c.usace.army.mil/adh">http://chl.erd.c.usace.army.mil/adh</a> . The program will be used to represent the Conowingo Reservoir and the Susquehanna Flats to analyze and will assess erosion and depositional characteristics of sediments in the Conowingo Reservoir and quantify sediment transport potential by grain size to the Bay from the reservoir system.	HH&C CoP Preferred Model
HEC-RAS (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 to capture the impacts of transport events on the sediment supply to Conowingo by simulating the upper reservoirs in the lower Susquehanna river reservoir system. Sediment loads entering the upper reservoirs from the Susquehanna River will be used for the 1D sediment rating curve. Sediment will be routed through the upper two reservoirs using the model, accounting for both sediment deposition and erosion in the reservoirs. The output of the model will then be used as the input sediment rating curve for the 2D model.	HH&C CoP Preferred Model

## 10. REVIEW SCHEDULES AND COSTS

- a. **ATR Schedule and Cost.** ATR will be completed prior to submission of the draft Assessment to the MSC. ATR costs for the Assessment are estimated to be \$5,000 per reviewer. These costs are cost-



shared with the study's sponsor. ATR will be completed on the following documentation:

<u>ATR</u>	<u>Status</u>	<u>Date</u>
Assessment	To be scheduled	January 2014 (estimate)

- b. **Type I IEPR Schedule and Cost.** None.
- c. **Model Certification/Approval Schedule and Cost.** None

## **11. PUBLIC PARTICIPATION**

The LSRWA team developed a Stakeholder Involvement Plan for the Assessment. Stakeholders will be updated and involved throughout the study via email and the Assessment Quarterly meetings are open to all stakeholders. All documents developed during the Assessment will be posted on the project website: <http://mddnr.chesapeakebay.net/LSRWA/index.cfm>. Additionally, there will be at least two workshops for stakeholders to attend and provide input on the Assessment. The ATR team will be provided any significant public comments.

Additionally, the public will be able to comment on the LSRWA during the study process. Comments and responses will be documented by the date the comment was received, and provided as an attachment that will follow the assessment through the development, review, and approval process. This will include comments from all ATRs and comments received from the public throughout the study process.

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

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

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

- Anna Compton, Quality Control Manager, Baltimore District, 410-962-4633
- Roselle Henn, District Support Team Environmental Team Leader, North Atlantic Division, 347-370-4562
- Jodi Creswell, Operational Director, ECO-PCX, 309-794-5448

**ATTACHMENT 1: TEAM ROSTERS**

**Table 1: Interagency Study Team Members**

<b>Name</b>	<b>Role</b>	<b>Affiliation/Office Symbol</b>
<b><i>Non-Federal Team members</i></b>		
Bruce Michael	Director	DNR
Shawn Seaman	Project Manager	DNR
Herb Sachs	Special Projects Coordinator	MDE
Matt Rowe	Project Manager	MDE
Tim Fox	Project Manager	MDE
Adam Rettig	Project Manager	MDE
Jeff Halka	Director	MGS
<b><i>Federal Team Members</i></b>		
Anna Compton	Biologist, Study Manager	USACE, CENAB-PL-P
Bob Blama	Biologist, Operations	USACE, CENAB-Ops
Carey Nagoda	Hydrologic and Hydraulic Engineer, Engineering Coordinator	USACE, CENAB-EN-WW
Chris Spaur	Biologist, Environmental Studies	USACE, CENAB-PL-P
Angie Sowers	Environmental Policy Advisor	USACE, CENAB-PL-P
Dan Bierly	Plan Formulation and Policy Advisor	USACE, CENAB-PL-P
Claire O'Neill	Project Manager	USACE, CENAB-PP-C
Carl Cerco	Research Hydrologist	USACE, ERDC
Steve Scott	Research Hydraulic Engineer	USACE, ERDC
John Balay	Hydrologist	SRBC
Dave Ladd	Project Manager	SRBC
Andrew Gavin	Project Manager	SRBC
Mark Bryer	Project Manager	TNC
Kathy Boomer	Project Manager	TNC
Gary Shenk	Hydrologist	EPA
Mike Langland	Hydrologist	USGS

**Table 2: Vertical Team Members**

<b>Name</b>	<b>Discipline</b>	<b>Phone</b>	<b>Email</b>
Roselle Henn	Environmental Team Lead, CENAD	347-370-4562	<a href="mailto:Roselle.E.Henn@usace.army.mil">Roselle.E.Henn@usace.army.mil</a> !
Jodi Creswell	Operational Director/ECO-PCX/CEMVD	309-794-5448	<a href="mailto:Jodi.K.Creswell@usace.army.mil">Jodi.K.Creswell@usace.army.mil</a> !

Joe Vietri	Chief, Planning & Policy, CENAD	347-370-4570	<a href="mailto:Joseph.R.Vietri@usace.army.mil">Joseph.R.Vietri@usace.army.mil</a>
Robert Pace	Chief, Planning Division, CENAB	410-962-4900	<a href="mailto:Robert.S.Pace@usace.army.mil">Robert.S.Pace@usace.army.mil</a>

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

**COMPLETION OF AGENCY TECHNICAL REVIEW**

The Agency Technical Review (ATR) has been completed for the <type of product> for <project name and location>. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. 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<sup>sm</sup>.

SIGNATURE

Name

ATR Team Leader

Office Symbol/Company

Date

SIGNATURE

Name

Project Manager

Office Symbol

Date

SIGNATURE

Name

Architect Engineer Project Manager<sup>1</sup>

Company, location

Date

SIGNATURE

Name

Review Management Office Representative

Office Symbol

Date

**CERTIFICATION OF AGENCY TECHNICAL REVIEW**

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

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

SIGNATURE

Name

Chief, Engineering Division

Office Symbol

Date

SIGNATURE

Name

Chief, Planning Division

Office Symbol

Date

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

**ATTACHMENT 3: REVIEW PLAN REVISIONS**

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

#### ATTACHMENT 4: Acronyms and Abbreviations

Acronym	Definition
2D-ADH	Two Dimensional Adaptive Hydraulics Model
ASA(CW)	Assistant Secretary of the Army, Civil Works
ATR	Agency Technical Review
CBEMP	Chesapeake Bay Environmental Model package
CBP	Chesapeake Bay Program
CECW-PC	Corps of Engineers Civil Works-Policy Compliance
Cost DX	Cost Engineering Directory of Expertise
DQC	District Quality Control
EC	Engineering Circular
ECO-PCX	National Ecosystem Planning Center of Expertise
EO	Executive Order
ER	Engineering Regulation
FCSA	Feasibility Cost-Sharing Agreement
FWS	US Fish and Wildlife Service
FY	Fiscal Year
HEC-RAS	Hydrologic Engineering Center- River Analysis System
HH&C CoP	Hydrology, Hydraulics and Coastal Community of Practice
HQUSACE RIT	United States Army Corps of Engineers, Headquarters, Regional Integration Team
HSPF	Hydrological Simulation Program
ICM	Integrated Compartment Model
IEPR	Independent External Peer Review
LERRDS	Lands, Easements, Rights-of-Way, Relocations, Dredging
LSRWA	Lower Susquehanna River Watershed Assessment
MD DNR	MD Department of Natural Resources
MDE	Maryland Department of the Environment
MGS	MD Geologic Survey
NAB	North Atlantic Baltimore
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
OMRR&R	Operation, maintenance, repair, replacement and rehabilitation
PDT	Project Delivery Team
PMP	Project Management Plan
RMC	Risk Management Center
RMO	Review Management Organization
SAV	Submerged Aquatic Vegetation
SET	Scientific and Engineering Technology
SRBC	Susquehanna River Basin Commission
STF	Sediment Task Force
TMDL	Total Maximum Daily Loads
TNC	The Nature Conservancy

TRACES	Corps' Tri-Service Automated Cost Engineering System
USACE	United States Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	US Geological Survey
WIP	Watershed Implementation Plans
WSM	Watershed Model