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

REPLY TO
ATTENTION OF

DEC 5 2012

CENAD-PD-PP

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

SUBJECT: Review Plan Approval for Middle Potomac River Watershed Assessment, Maryland, Virginia, Pennsylvania, West Virginia and the District of Columbia

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

**Middle Potomac River Watershed Assessment**
**Potomac River Sustainable Flow and Water Resources Analysis**
**Maryland, Virginia, Pennsylvania, West Virginia, and the District of Columbia**

**Baltimore District**
**In partnership with:**
**The Nature Conservancy**

**MSC Approval Date:** November 2012
**Last Revision Date:** August 2011

US Army Corps
of Engineers ®

REVIEW PLAN

Middle Potomac River Watershed Assessment
Potomac River Sustainable Flow and Water Resources Analysis
Maryland, Virginia, Pennsylvania, West Virginia, and the District of Columbia

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## 1. PURPOSE AND REQUIREMENTS

**a. Purpose.** This review plan defines the scope and level of peer review for the Middle Potomac River Watershed Assessment, Potomac River Sustainable Flow and Water Resources Analysis.

**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 2010
(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) EC 1105-2-411, Watershed Plans, 15 Jan 2010
(6) Middle Potomac River Watershed Assessment Project Management Plan, 11 Feb 2009
(7) Planning Division, Civil Project Development Branch, Quality Management Plan, 7 October 2009

**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 Planning Center of Expertise for Ecosystem Restoration (ECO-PCX).

No feasibility level cost estimates are included in this watershed assessment. The RMO will not need to coordinate with the Cost Engineering Directory of Expertise (DX) to conduct ATR of cost estimates, construction schedules and contingencies.

## 3. STUDY INFORMATION

**a. Watershed Assessment.** The Middle Potomac River Watershed Assessment, Potomac River Sustainable Flow and Water Resources Analysis is being undertaken with the goal to prepare and finalize a document that identifies the flow needs of the aquatic ecosystem within subwatersheds of the Potomac River under existing and projected future conditions. This study is being conducted under the Section 729 authority and will not directly lead to project construction. Alternatives are not being developed for the purpose of decision making as part of this assessment. The watershed assessment is not an implementation document since it will not directly lead to implementation of

any project. As defined by EC 1165-2-209 the watershed assessment is an "other work product". No National Environmental Policy Act (NEPA) documentation will be produced with this watershed assessment.

The Middle Potomac River Watershed Assessment will result in a summary report that could inform a potential future basin-wide comprehensive plan. The report will summarize the following work products: compilation of a basin-wide database of biological and water quality data; development of future water use projections; assessment of current hydrologic alteration and projected future alteration based on water demand and climate change; literature review of basin-wide flow-ecology relationships for flow-dependent species; development of environmental flow recommendations for the mainstem Potomac River based on the best available science and expert opinion; and the creation of hydrologic alteration-ecological response relationships that will aid in the development of environmental flow recommendations for classes of tributary streams.

This watershed assessment does not directly lead to changes in operation at USACE projects. Based on the recommendations of the watershed assessment, further study may be necessary which could result in operational changes at Corps' dams. A determination on the need for IEPR will be made for individual studies on Corps' dam operational changes.

b. **Study/Project Description.** The Middle Potomac River Watershed Assessment, Potomac River Sustainable Flow and Water Resources Analysis is being conducted under several project authorities in partnership with The Nature Conservancy (TNC). The primary authority for the study is Section 729 of the Water Resources Development Act (WRDA) of 1986, as amended by Section 202, WRDA of 2000 and Section 2010, WRDA of 2007. In addition to the Section 729 authority, several Congressional committee resolutions provide additional authority for USACE to study the Potomac River watershed. These resolutions include the Senate Public Works Committee resolutions dated 26 January 1956 and 6 July 1959, as well as a Senate Committee on the Environment and Public Works resolution dated 23 May 2001.

The Middle Potomac River basin is a subwatershed of the Chesapeake Bay and encompasses 11,500 square miles (the entire Potomac watershed is 14,679 square miles). It contains 175 miles of the Potomac River and approximately 75 percent of the Potomac basin's residents. The Middle Potomac watershed includes a diverse landscape, with urban, rural, and natural areas in six different eco-regions. The Potomac River is also the only tributary in the Chesapeake Bay watershed that includes all signatories of the Chesapeake Bay 2000 agreement, and five of seven states located within the overall Chesapeake Bay watershed (Maryland, Pennsylvania, Virginia, West Virginia and the District of Columbia). The major subwatersheds of the Middle Potomac watershed include the South Branch Potomac River, Back Creek, the Cacapon River, the Shenandoah River, the Monocacy River, the Anacostia River, and the Occoquan River.

The purpose of the current effort is to conduct and document a watershed assessment for the Middle Potomac River basin. As part of the watershed assessment, the project team will consider water supply, environmentally sustainable flow, ecosystem protection and restoration, drought preparedness, and watershed resource management in the Middle Potomac River watershed in the District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia. The components of this assessment will describe current and future conditions that are likely to have significant impacts on human and ecological needs within the basin. The assessment will include hydrologic modeling

activities, data gathering, and ecological investigations. The goal is to identify key ecological needs, current and future human activities (especially withdrawals, dam operations and land use development), and potential effects of climate change on the basin's hydrology, and how these might be balanced and mitigated to prevent water use conflicts and ecological degradation of the Potomac River's native species and natural communities in a 50 to 100-year timeframe. The assessment will include attention to the following:

- Surface and groundwater withdrawals;
- Dams and other impoundments;
- Effects of land use change and increase in impervious surfaces on flow;
- Cumulative hydrologic impacts of withdrawals and impoundments;
- Projected changes to demand for water in the basin (including consumptive use); and
- Condition and flow requirements of the basin's aquatic species and ecosystems.

Study findings may be used in future USACE study efforts to evaluate dam operations in the watershed. Study findings may also be used to re-evaluate flow regulations to which USACE is a signatory. The non-federal sponsor may use the study findings to help plan for future water management needs in the watershed, including the needs of power producers and water suppliers.

c. **Factors Affecting the Scope and Level of Review.** The watershed assessment conducted for the Middle Potomac River Watershed Assessment is anticipated to be challenging and beneficial, but it will not be novel, controversial or precedent-setting. The watershed assessment focuses on a major tributary to the Chesapeake Bay, a nationally significant estuary, and the Potomac River has been identified as a priority river system for assessment. The study will provide information for use in considering long-term changes to flow release schemes for basin reservoirs, ecological restoration, flows to sustain aquatic habitat, and conservation strategies. The study will not directly lead to project construction. The study will not directly lead to any USACE action. Future basin flow conditions will be projected, but no project alternatives will be evaluated. There are no human life/safety issues that will be addressed in the study due to the study scope and questions addressed.

Project challenges will arise from synthesizing current scientific understanding of basin ecology with the current understanding of basin hydrology. The approaches to be used have been formulated and published in peer-reviewed journals by The Nature Conservancy, and have been used in numerous basin evaluations across the nation. The process to be followed was outlined by Richter et al. (2006), and elaborated upon by Poff et al. 2009. No new scientific information is expected to be generated; rather, existing scientific information and expert analysis will be synthesized using existing models and methods.

Other Federal and State agencies have expressed in interest in the study, both for its implications in protecting ecosystem function, as well as for its implications for long-term watershed and water use planning.

While this watershed assessment will not result in USACE action, ATR will be conducted. As outlined in Section 5, a risk-based assessment was conducted for the study and ATR is appropriate. The technical analyses that the study is based on will be reviewed by many regional and national experts on hydrology and ecology. Flow recommendations will be based on technical analyses and a

collaborative social process in a workshop setting by regional and national experts. Implementation of these recommendations will be documented in subsequent studies, as appropriate, and will be subjected to appropriate reviews for those studies.

d. **In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR as appropriate. The in-kind products and analyses to be provided by the non-Federal sponsor include: a watershed assessment report which will include a summary of the hydrological characterization of the basin with a synthesis of existing reports, relevant studies and available data, flow recommendations, and data gaps. These in-kind contributions will be included as appendices with the final report.

## 4. DISTRICT QUALITY CONTROL (DQC)

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. "Other work products" should also 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.** 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 at each review. 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.** Draft and final watershed assessment documents, products and analyses provided by non-Federal sponsors as in-kind services, as well as all read-ahead material will undergo DQC, as outlined in the Baltimore District Planning Division Quality Management Plan of 2009.

## 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.

a. **Decision on ATR.** The PDT has performed a risk assessment for this study and for the reasons stated below, determined that ATR is appropriate for this watershed assessment.

Risk Informed Decision

(1) There is no design with this study, and the study does not directly lead to construction.

(2) The watershed assessment is evaluating flow regimes for various river types. Flows are being evaluated for their effects on aquatic ecology under alternative future hydrologic scenarios. Other flow effects are being considered (i.e. consumptive use, assimilative capacity), but ecological flow needs are the primary consideration in determining

recommended flow regimes and evaluating consequences of alternative future hydrologic scenarios.

(3) Recommendations for flows that support ecological health are generated as part of a social process backed by scientific analysis. This social process is conducted as a series of collaborative workshops involving technical experts, stakeholders, and policymakers. These workshops involve identification of species and ecological groups that are sensitive to flow alterations, identification of societal values and management needs, consensus on acceptable ecological conditions, and finally the development of recommendations for environmental flow standards – based on the other technical work done in the study. Implementation of these recommendations would involve further study and the review requirements for those studies would be determined study by study.

(4) There is no formal cost estimate because there is no recommendation for project implementation.

(5) The watershed assessment does not require NEPA documentation. If subsequent studies are undertaken in which flow recommendations are implemented through management actions, NEPA documentation will be undertaken during those study processes.

(6) The watershed assessment does not impact a structure or feature of a structure whose performance involves potential life safety risks. The watershed assessment will identify flows necessary to support ecological health and evaluate alternative future hydrologic scenarios on ecological health. Study products may inform future feasibility or implementation documents that impact structures whose performance involves potential life safety risks. A determination on necessary review requirements for those studies will be made when their review plans are drafted.

(7) This watershed assessment will not lead to project implementation. If the study is not completed, there is a risk that USACE and other agencies will have an incomplete understanding of the ecological needs of aquatic communities in the Middle Potomac basin. Study products will be based upon the best science and data available, and non-performance in the science and data would lead to an incomplete understanding of flows and flow relationships in the Potomac River Basin. However, as science and data collection advances, the conclusions reached in the study can be revisited and revised.

(8) The watershed assessment has a study cost of $1.2M and no investment of public monies are required beyond the study cost.

(9) This watershed assessment does not directly lead to project implementation and therefore does not support a budget request.

(10) This watershed assessment does not directly lead to changes in operation at USACE projects. Based on the recommendations of the watershed assessment, further study may be necessary which could result in operational changes at Corps' dams. A determination on the need for ATR will be made for individual studies on Corps' dam operational changes.

(11) This watershed assessment does not involve ground disturbances.

(12) The watershed assessment does not affect any special features.

(13) The watershed assessment does not involve activities that trigger regulatory permitting.

(14) The watershed assessment does not involve activities that could potentially generate hazardous wastes and/or disposal of hazardous materials.

(15) The watershed assessment does not reference the use of or reliance on manufacturers' engineers and specifications.

(16) The watershed assessment does not involve utility systems and therefore does not rely on local authorities for inspection/certification.

(17) 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 to determine flows necessary for ecological health and resilience and to evaluate alternative future hydrologic impacts on flows and ecological health.

Other Considerations

(18) The technical analyses are being undertaken by experts on Potomac River Basin hydrology and ecology and will be reviewed by Basin stakeholders, other Potomac River experts, and experts on the scientific methodology used in the analysis. Experts include practitioners who had been involved and contributed directly to other sustainable flow projects undertaken by USACE such as the Connecticut River Watershed Study.

**b. Products to Undergo ATR**

(1) Draft Middle Potomac Watershed Assessment, Potomac River Sustainable Flow and Water Resources Analysis Report and Appendices

(2) Final Middle Potomac Watershed Assessment, Potomac River Sustainable Flow and Water Resources Analysis Report and Appendices

**c. Required ATR Team Expertise**

| ATR Team Members/Disciplines | Expertise Required |
|---|---|
| ATR Lead | The ATR lead should be a senior professional with extensive experience in preparing Civil Works products and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. Typically, the ATR lead will also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc). |
| Planning | The planning reviewer should be a senior water resources planner with experience in ecosystem restoration including low flow management, water supply tradeoffs and land use planning. There will be extensive alternative analyses within the plan that would need to be reviewed along with determinations of likely interested parties for project implementation. |
| Environmental Resources | The environmental reviewer should be well versed on ecosystems and fishery response to low flows. Although the master plan will not include any National Environmental Policy Act (NEPA) evaluations, the concepts and principles behind NEPA will be used to determine the appropriateness of recommended actions. |
| Hydrology and Hydraulic Modeling | The interaction between land use and its impact on streams is of paramount importance in this investigation. The hydrology and hydraulic modeling reviewer should be familiar with standard hydrologic modeling, stream routing, flow statistics, and their applications to ecosystem decision making. |

**d. Documentation of ATR.** DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

(1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
(2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
(3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and
(4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any 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 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.** This study does not meet any mandatory trigger for Type I IEPR: there is no threat to human life, there will be no construction and the total study cost is $1.2 million - well under the $45 million ceiling, the study is not controversial and project recommendations are intended to preserve and enhance ecological health and resilience. EC 1165-2-209 states that "Meeting the specific conditions identified for possible exclusions is not, in or of itself, sufficient grounds for recommending an exclusion. A deliberate, risk-informed recommendation whether to undertake IEPR shall be made and documented by the project delivery team (PDT)." The PDT has performed a risk assessment for this study and for the reasons stated below, determined that IEPR is not applicable for this watershed assessment.

    (1) There is no design with this study, and the study does not directly lead to construction.
    (2) The watershed assessment is evaluating flow regimes for various river types. Flows are being evaluated for their effects on aquatic ecology under alternative future hydrologic scenarios. Other flow effects are being considered (i.e. consumptive use, assimilative capacity), but ecological flow needs are the primary consideration in determining recommended flow regimes and evaluating consequences of alternative future hydrologic scenarios.
    (3) Recommendations for flows that support ecological health are generated as part of a social process backed by scientific analysis. This social process is conducted as a series of collaborative workshops involving technical experts, stakeholders, and policymakers. These workshops involve identification of species and ecological groups that are sensitive to flow alterations, identification of societal values and management needs, consensus on acceptable ecological conditions, and finally the development of recommendations for

environmental flow standards – based on the other technical work done in the study. Implementation of these recommendations would involve further study and the review requirements for those studies would be determined study by study.

(4) There is no formal cost estimate because there is no recommendation for project implementation.

(5) The watershed assessment does not require NEPA documentation. If subsequent studies are undertaken in which flow recommendations are implemented through management actions, NEPA documentation will be undertaken during those study processes.

(6) The watershed assessment does not impact a structure or feature of a structure whose performance involves potential life safety risks. The watershed assessment will identify flows necessary to support ecological health and evaluate alternative future hydrologic scenarios on ecological health. Study products may inform future feasibility or implementation documents that impact structures whose performance involves potential life safety risks. A determination on necessary review requirements for those studies will be made when their review plans are drafted.

(7) This watershed assessment will not lead to project implementation. If the study is not completed, there is a risk that USACE and other agencies will have an incomplete understanding of the ecological needs of aquatic communities in the Middle Potomac basin. Study products will be based upon the best science and data available, and non-performance in the science and data would lead to an incomplete understanding of flows and flow relationships in the Potomac River Basin. However, as science and data collection advances, the conclusions reached in the study can be revisited and revised.

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(16) The watershed assessment does not involve utility systems and therefore does not rely on local authorities for inspection/certification.

(17) 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 to determine flows necessary for ecological health and resilience and to evaluate alternative future hydrologic impacts on flows and ecological health.

**b. Products to Undergo Type I IEPR.** Not applicable.

**c. Required Type I IEPR Panel Expertise.** Not applicable.

d. **Documentation of Type I IEPR.** Not applicable.

## 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. This watershed assessment only includes technical analysis and there are no policy or legal issues to be addressed.

## 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. This watershed assessment will not include any cost estimates, thus no cost certification is 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).

a. **Planning Models.** The following planning models are anticipated to be used in the development of the watershed assessment: No planning models are to be used in the performance of this study. Study findings and ecological response to flows are to be based on literature review, biological and hydrologic data analysis, best professional judgment, and expert consultation. The analysis of basin hydrology is to be analyzed through an engineering model which returns hydrologic statistics, and

the Chesapeake Bay Model. The Chesapeake Bay Model will allow flow statistics to be generated at sites where there is no stream gage. The model allows the generation of a "baseline" hydrograph in which there are no alterations to hydrology (no impoundments, no development, pre-European settlement landcover), as well as hydrographs to be generated for differing future scenarios (altered land use, altered water use, climate changes). These models are engineering in nature and do not return ecosystem benefits.

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

| Model Name and Version | Brief Description of the Model and How It Will Be Applied in the Study | Approval Status |
|---|---|---|
| HSPF (Chesapeake Bay Watershed Model v 5.3) | The Chesapeake Bay Watershed Model divides the 64,000-square mile Chesapeake Bay watershed into 94 model segments. Each segment contains information generated by a hydrologic submodel, a non-point source submodel, and a river submodel. The hydrologic submodel uses rainfall, evaporation, and meteorological data to calculate runoff and sub-surface flow for all the basin land uses, including forest, agricultural, and urban lands. The surface and sub-surface flows ultimately drive the non-point source submodel, which simulates soil erosion and pollutant loads from the land to the rivers. The river submodel routes flow and associated pollutant loads from the land through the lakes, rivers, and reservoirs to the Bay. This watershed assessment did not utilize the outputs of the non-point source submodel. The model was used to generate flow-duration curves for ungaged streams, and allows for the generation of flow-duration curves under various land-use scenarios, including all forest. | HSPF – HH&C CoP Allowed for Use |

| | | |
|---|---|---|
| Indicators of Hydrologic Alteration (IHA) v 7.1 | The Indicators of Hydrologic Alteration (IHA) is a software program, developed by The Nature Conservancy that assesses 67 ecologically-relevant statistics derived from daily hydrologic data. For instance, the IHA software can calculate the timing and maximum flows of each year's largest flood or lowest flows, and then calculates the mean and variance of these values over some period of time. Comparative analysis can then help statistically describe how these patterns have changed for a particular river or lake, due to abrupt impacts such as dam construction, or more gradual trends associated with land- and water-use change.<br><br>IHA will be used to analyze index gauges to produce recommended flow statistics.<br><br>Richter, B.D., J.V. Baumgartner, J. Powell, and D.P. Braun 1996. "A Method for Assessing Hydrologic Alteration Within Ecosystems". Conservation Biology 10:1163-1174.<br><br>Richter, B.D, J.V. Baumgartner, R. Wigington, and D.P. Braun, "How Much Water Does a River Need?" Freshwater Biology 37, 231-249.<br><br>Richter, B.D., J.V. Baumgartner, D.P. Braun, and J. Powell. 1998. "A Spatial Assessment of Hydrologic Alteration Within a River Network." Regulated Rivers 14:329-340. | HH&C CoP Preferred Model |

**10. REVIEW SCHEDULES AND COSTS**

a. **ATR Schedule and Cost.** ATR will be completed prior to submission of documentation to the MSC. ATR costs for the watershed management study are not yet determined but have been budgeted at $24,000. These costs are cost-shared with the study's non-federal sponsor. ATR will be completed on the following documentation:

| ATR | Status | Date |
|---|---|---|
| Watershed Assessment | Scheduled | Feb 12 |

b. **Type I IEPR Schedule and Cost.** Not applicable.

c. **Model Certification/Approval Schedule and Cost.** Not applicable.

**11. PUBLIC PARTICIPATION**

As part of the public involvement process, periodic project factsheets will be developed, distributed to interested parties, and posted on the project website, which is being maintained by the Interstate Commission on the Potomac River Basin (ICPRB) website (www.potomacriver.org/susstainableflows). Additionally, there will be at least two webinars available for interested people to attend, and these will also be available as recordings on the ICPRB website. At least two expert workshops will be held, involving regional and national experts on the Potomac River, river ecology, river flows needs, and other relevant topics.

Additionally, the public will be able to comment on the Middle Potomac River Watershed Assessment during the study process. The public can provide comments at any time during the study process to the study manager at the following address:

U.S. Army Corps of Engineers
ATTN: Middle Potomac Watershed Assessment Study Manager, CENAB-PL-P
P.O. Box 1715
Baltimore, MD 21203

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.

All published reports can be found at Baltimore District's website (www.nab.usace.army.mil) as well as directions for obtaining any information that may be disclosed under the Freedom of Information Act (Public Law 89-554, 80 Stat. 383; amended 1996, 2002, 2007).

## 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 watershed assessment. 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:

- Andrew Roach, Study Manager, Baltimore District
  410-962-8156, Andrew.A.Roach@usace.army.mil

- Joseph Vietri, Chief, Planning and Policy Division, North Atlantic Division
  718-765-7070, Joseph.R.Vietri@usace.army.mil

- Jodi Staebell, Operations Director, Ecosystem Restoration Planning Center of Expertise
  309-794-5448, Jodi.k.staebell@usace.army.mil

**14. 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 the PCX will occur through the district planning chief. Signatures by the individuals below indicate approval of the plan as proposed.

19 Apr 2011

Andrew Roach
Study Manager
Project Delivery Team

Date

19 Apr. 2011

Amy Guise
Chief, Civil Project Development Branch
Baltimore District

Date

19 Apr 2011

Robert Gore
Assistant Chief, Planning Division
Baltimore District

Date

Joseph Vietri
Chief, Planning and Policy Division
North Atlantic Division

Date

**ATTACHMENT 1: TEAM ROSTERS**

PDT

| Discipline | Name | Email | Phone Number |
|---|---|---|---|
| Project Manager | Claire O'Neill | Claire.D.Oneill@usace.army.mil | 410-962-0876 |
| Study Manager | Andrew Roach | Andrew.A.Roach@usace.army.mil | 410-962-8156 |
| Biologist | Andrew Roach | Andrew.A.Roach@usace.army.mil | 410-962-8156 |
| Hydrologist | Bill Haines | James.W.Haines@usace.army.mil | 410-962-6768 |

Vertical Team

| Title | Name | Email | Phone Number |
|---|---|---|---|
| District Planning Coordinator | Dan Bierly | Daniel.M.Bierly@usace.army.mil | 410-962-4458 |
| Operations Director, PCX Ecosystem Restoration | Jodi Staebell | Jodi.k.staebell@usace.army.mil | 309-794-5448 |
| DST | Paul Sabalis | Paul.Sabalis@usace.army.mil | 718-765-7089 |
| NAD Planning Chief | Joe Vietri | Joseph.R.Vietri@usace.army.mil | 718-765-7070 |

## ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECSION DOCUMENTS

### COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the *<type of product>* for *<project name and location>*. The ATR was conducted as defined in the project's review plan to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing U.S. Army Corps of Engineers policy. The ATR also assessed the district quality control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks[sm].

*SIGNATURE* _____ Date _____

*Name*
ATR Team Leader
*Office Symbol/Company*

*SIGNATURE* _____ Date _____

*Name*
Project Manager
*Office Symbol*

*SIGNATURE* _____ Date _____

*Name*
Architect Engineer Project Manager[1]
*Company, location*

*SIGNATURE* _____ Date _____

*Name*
Review Management Office Representative
*Office Symbol*

### CERTIFICATION OF AGENCY TECHNICAL REVIEW

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

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

*SIGNATURE* _____ Date _____

*Name*
Chief, Engineering Division
*Office Symbol*

*SIGNATURE* _____ Date _____

*Name*
Chief, Planning Division
*Office Symbol*

[1] Only needed if some portion of the ATR was contracted

**ATTACHMENT 3: REVIEW PLAN REVISIONS**

| Revision Date | Description of Change | Page / Paragraph Number |
|---|---|---|
| | | |
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| | | |
| | | |
| | | |

## ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

| Term | Definition | Term | Definition |
|---|---|---|---|
| AFB | Alternative Formulation Briefing | NED | National Economic Development |
| ASA(CW) | Assistant Secretary of the Army for Civil Works | NER | National Ecosystem Restoration |
| ATR | Agency Technical Review | NEPA | National Environmental Policy Act |
| CSDR | Coastal Storm Damage Reduction | O&M | Operation and maintenance |
| DPR | Detailed Project Report | OMB | Office and Management and Budget |
| DQC | District Quality Control/Quality Assurance | OMRR&R | Operation, Maintenance, Repair, Replacement and Rehabilitation |
| DX | Directory of Expertise | OEO | Outside Eligible Organization |
| EA | Environmental Assessment | OSE | Other Social Effects |
| EC | Engineer Circular | PCX | Planning Center of Expertise |
| ECO-PCX | Ecosystem Restoration Planning Center of Expertise | PDT | Project Delivery Team |
| EIS | Environmental Impact Statement | PAC | Post Authorization Change |
| EO | Executive Order | PMP | Project Management Plan |
| ER | Ecosystem Restoration | PL | Public Law |
| FDR | Flood Damage Reduction | QMP | Quality Management Plan |
| FEMA | Federal Emergency Management Agency | QA | Quality Assurance |
| FRM | Flood Risk Management | QC | Quality Control |
| FSM | Feasibility Scoping Meeting | RED | Regional Economic Development |
| GRR | General Reevaluation Report | RMC | Risk Management Center |
| Home District/MSC | The District or MSC responsible for the preparation o the decision document | RMO | Review Management Organization |
| HQUSACE | Headquarters, U.S. Army Corps of Engineers | RTS | Regional Technical Specialist |
| ICPRB | Interstate Commission for the Potomac River Basin | SAR | Safety Assurance Review |
| IEPR | Independent External Peer Review | TNC | The Nature Conservancy |
| ITR | Independent Technical Review | USACE | U.S. Army Corps of Engineers |
| LRR | Limited Reevaluation Report | WRDA | Water Resources Development Act |
| MSC | Major Subordinate Command | | |