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

CENAD-PSD-P

SEP 10 2009

MEMORANDUM FOR Commander, New England District, ATTN: CENAE-EP-P

SUBJECT: Review Plan Approval for Blackstone River Watershed Investigation Interim Report for the Fisherville Pond, Grafton, MA

1. The enclosed Review Plan for the Blackstone River Watershed Investigation Interim Report for the Fisherville Pond, Grafton, MA has been prepared in accordance with EC 1105-2-410, Review of Decision Documents, dated 22 Aug 2008.

3. The Plan has been made available for public comment, and any comments received have been incorporated. It has been coordinated with the Ecosystem Restoration Planning Center of Expertise of the Mississippi Valley Division, which is the lead office to execute this plan. For further information, contact the PCX at 309-794-5448. The plan currently does not include independent external peer review.

4. 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 Plan or its execution will require new written approval from this office.

Encl

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

DEPARTMENT OF THE ARMY
MISSISSIPPI VALLEY DIVISION, CORPS OF ENGINEERS
P.O. BOX 80
VICKSBURG, MISSISSIPPI 39181-0080

REPLY TO
ATTENTION OF:

CEMVD-RB-T 02 September 2009

MEMORANDUM FOR Commander, North Atlantic Division
ATTN: (Joe Vietri, CENAD-PSD-P)

SUBJECT: Blackstone River Watershed Investigation Interim Report for the Fisherville Pond, Grafton, MA, Ecosystem Restoration Planning Center of Expertise Endorsement of Review Plan

1. References:
a. EC 1105-2-410, Review of Decision Documents, 22 August 2008.

2. The enclosed Review Plan (RP) complies with all applicable policy and provides an adequate agency technical review of the plan formulation, engineering, and environmental analyses, and other aspects of the plan development. The Ecosystem Restoration Planning Center of Expertise (ECO-PCX) has reviewed the RP and documentation of the review is enclosed.

3. The ECO-PCX concurs with the conclusion that Independent External Peer Review of this project is not necessary. Review of the 7 ecosystem output models used in the study will be conducted as part of Agency Technical Review. Non-substantive changes to this RP do not require further approval.

4. The ECO-PCX recommends the RP for approval by the MSC Commander. Upon approval of the RP, please provide a copy of the approved RP, a copy of the MSC Commander approval memorandum, and the link to where the RP is posted on the District website to Jodi Staebell and Sue Ferguson.

5. Thank you for the opportunity to assist in the preparation of the Review Plan. Please continue to coordinate the Agency Technical Review and Model Certification efforts outlined in the RP with the ECO-PCX.

Jodi K Staebell

Enclosures (2)

Jodi Staebell
Operational Director,
National Ecosystem Planning
Center of Expertise

CF:
CEMVD-RB-T (Vigh, Staebell)
CEMVD-PD-N (Smith, Wilbanks)
CELRN-PM-P (S. Ferguson, R. Hedrick)
CENAD-PSD-P (L. Cocchieri)
CENAE-EP-PS (C. Hatfield)

REVIEW PLAN
FOR
BLACKSTONE RIVER WATERSHED INVESTIGATION

INTERIM REPORT

FISHERVILLE POND
GRAFTON, MASSACHUSETTS

REVIEW PLAN

New England District

August 2009

REVIEW PLAN
Blackstone River Watershed Investigation
Interim Report – Fisherville Pond
August 2009

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1. Purpose

Recent Corps guidance, ER 1105-2-410 Review of Decision Documents, issued 22 August 2008, outlines new procedures for conducting technical reviews and ensuring the quality and credibility of decision documents. The subject guidance includes procedures for conducting District Quality Control (DQC), Agency Technical Review (ATR) and Independent External Peer Review (IEPR) when appropriate. These various review elements shall be documented in a Review Plan (RP) as part of the Project Management Plan.

The purpose of this stand alone document is to present a Review Plan for the Blackstone River Watershed Investigation Interim Report for the Fisherville Pond restoration site in Grafton, Massachusetts. The review plan is used to document and assign the appropriate level and review independence, establish the procedures, and assign responsibilities for conducting the review of the decision document to ensure the quality and credibility of all conclusions and recommendations and decisions presented in the decision document. This plan is compliant with EC 1105-2-410 Review of Decision Documents, 22 August 2008, Appendix C.

2. Project Background

The goal of the Blackstone River Feasibility Study is ecosystem restoration, with a focus on restoration of aquatic, wetland, and riparian habitat. The study's intent is to formulate projects that increase habitat and improve habitat quality in the Blackstone watershed. The feasibility study is cost shared equally between the Corps and the non-federal sponsor, the Massachusetts Executive Office of Energy and Environmental Affairs. The cost sharing agreement was signed in May 1999. Work on the overall study continued through 2003 at such time the sponsor informed us they could provide anymore funding due to state budget constraints. The sponsor requested that as we use remaining study funds to finish up several ongoing efforts including the development of a recommendation for the restoration of Fisherville Pond. This would include developing an interim report for the proposed ecosystem restoration project for Fisherville Pond in Grafton, Massachusetts.

Since then the sponsor has been able to provide additional study funding and a draft interim report (formatted as an ERR, EIS not required) was written. However, several data gaps remain in the analysis (due to the break in study funding) that the District has recommended to the sponsor be filled prior to going forward with a full ATR review of the draft report. These gaps include additional sediment quantity and quality characterization at depth (could cause benefit calculations to change and effect cost estimates) and a limited human health risk assessment of the areas that will be included in our restoration efforts (something we agreed to do in the original study scope). The sediments in Fisherville Pond have been found to have varying degrees (highest in the southern and central portions of the pond, lowest in the northern) of ecological risk; the sponsor would like to know the benefit to humans of removing contaminated sediments as part of our restoration project. The sediment contamination does not rise to the level of HTRW. A preliminary risk assessment performed by the Corps on surface sediments in 1996 identified potential risks associated with consumption of fish from Fisherville Pond containing PCBs, dermal exposure and incidental ingestion of sediment containing metals (lead and chromium) and the PAH benzo(a)pyrene. Testing since 1996 confirmed elevated levels of PCBs in sport fish (largemouth bass) and elevated levels of PAHs and metals in Fisherville Pond sediment. Additional sediment cores and surface grabs are to be collected and analyzed this spring.

In the mean time, the District thought it best before it revisits its analysis with newly collected data, that the ATR process be initiated on the plan formulation (Alternative Formulation Briefing has not been held) and habitat benefits (selected models for habitat benefit calculation; challenging part of the study). The attachment to this RP includes a table and description of the models used and technical references for these models. While the Fisherville study is part of a General Investigation, it is essentially a pond restoration project and the approach used was adopted from other New England District pond restoration projects.

Three of the 7 models used, the Red-winged blackbird, American woodcock and Green-backed heron, are Pennsylvania Modified HEP Habitat Suitability Index Models (Brooks, R.P. and D. J. Prosser, 1994. PAM HEP HSI Models. Penn State Cooperative Wetlands Center, Forest Resources Laboratory, Pennsylvania State University, University Park, PA http://www.geog.psu.edu/wetlands/manual/appendix3.html). The benthic habitat analysis relies on a published sediment quality model. The other three models were developed by NAE and contain elements of published HEP models. None of these planning models has been certified or approved for use. The review of all of these models will be conducted as part of the Agency Technical Review and the review team may include both internal and external reviewers.

Five of the models (benthic, waterfowl, heron, blackbird, and lotic fish) strongly reflect the study's pond restoration objectives. Two of the models (riverine fish and woodcock) were added to reflect a dam removal alternative and do not directly relate to pond restoration. These models could be eliminated from the CE-ICA to simplify the analysis and address the concern about tradeoffs.

The sum of habitat units (HU's) from the 7 models was used in the CE-ICA. The analysis has been completed and a pond restoration alternative identified as the most cost effective best buy plan.

Seven ecological guilds were included in the habitat evaluation: fish (lotic and lentic), benthic invertebrates, waterfowl (dabbling ducks), wading birds, songbirds which use wet meadow, and birds which use wooded wetland habitat. Inclusion of these guilds assures that all major habitat types affected by project alternatives are represented in the analysis. Each guild was represented by a single species HEP model or a community model.

The underlying assumption of HEP is that the value of habitat for an organism or a guild (a group of organisms that share a similar habitat and use resources in a similar manner) can be described by a Habitat Suitability Index (HSI) model. HSI models typically denote habitat suitability of a species as the relationship between two or more environmental variables that are deemed to affect the species' presence, distribution, and/or abundance. The HSI is defined as a value between 0.0 and 1.0, with 1.0 representing maximum habitat quality of a species in a defined area at a specific point in time, and is assumed to be positively correlated to habitat carrying capacity. The HSI value is multiplied by the area of available habitat to obtain HU's. The HU values provide a quantitative estimate of overall habitat benefits.

For this study, benthic habitat value relied on a sediment toxicity model by Ingersoll et.al. (Ingersoll, 2000) that relates sediment toxicity in benthic invertebrates to concentrations of PAHs, metals, and PCBs in sediment. HEP models were used to assess benefits for piscivorous wildlife (green heron) and wetland dependent songbirds (common yellow throat and wren). The analysis included a risk based degradation factor to account for effect of sediment chemistry and Phragmites on wildlife habitat quality.

Predictions of future environmental conditions (i.e. water quality, sediment chemistry, and plant community composition) required for the models were based largely on professional judgment.

a. Project Authority

This feasibility study effort was conducted as a result of the recommendations of the Blackstone River Watershed Reconnaissance Investigation (USACE, 1997a) report. The studies were performed under the authority provided in the September 12, 1969 resolution known as the Southeastern New England (SENE) resolution. This resolution by the Committee on Public Works of the United States Senate gives the Army Corps of Engineers the authority to investigate solutions for "flood control, navigation, and related purposes in Southeastern New England ..."

b. Tentatively Selected Plan

Based on the analysis to date, the recommended plan is Alternative 5. This single purpose plan will excavate approximately 100,000 cy of sediment from Fisherville pond, cap 154,000 square feet of contaminated sediment, stabilize 2,600 liner feet of eroding embankment along the Blackstone River, restore about 10 acres of shallow water emergent vegetation, add hard underwater structures for fish habitat, and eradicate 3 acres of Phragmites. The estimated cost of the recommended plan is $22,500,000. This includes contingencies, overheads, real estate, design, and construction costs. A fish passage structure could be added to the recommended plan for an additional $500,000.

c. Center of Expertise Support.

The project has been coordinated with the Ecosystem Restoration PCX whose contact information is shown below.

Ecosystem Restoration PCX:

E-mail Address

MVD ERD Planning PCX - MVDERDPCX@usace.army.mil

Physical Address

U.S. Army Corps of Engineers
Mississippi Valley Division
1400 Walnut St., P.O. Box 80
Vicksburg, MS 39180

d. Project Delivery Team

The project delivery team is presented in Table 1. The project manager, Christopher Hatfield, is the main point of contact at the New England District for more information about this project and the review plan.

TABLE 1.
PROJECT DELIVERY TEAM

Discipline	Name	Office/Agency
Study Manager	Christopher Hatfield	CENAE-EP-P-SSS
GIS	Matthew Walsh	CENAE-EP-P-SSS
Ecologist	Michael Penko	CENAE-EP-VE
Human Health Risk Assessor	Lawrence Cain	CENAE-EP-G
Cultural Resources	Kathleen Atwood	CENAE-EP-VC
Economist	Edmund O'leary	CENAE-EP-VC
Civil Engineer	Coral Siligato	CENAE-EP-DC
Hydraulic Engineer	Donald Wood	CENAE-EP-WM
Geotechnical Engineer	Jonathan Kullberg	CENAE-EP-WG
Cost Engineer	Christopher Lindsay	CENAE-EP-DE
Surveying	Maureen Murray	CENAE-EP-DS
Real Estate	Joseph Redlinger	CENAE-RE
Construction	Christopher Turek	CENAE-CO-EA-NB
Fish Passage Engineer	Richard Quinn	USFWS

3. Project Significance

The interim report requires an Agency Technical Review (ATR). Criteria used to determine this review requirement is listed below.

- The interim report is a decision document resulting from a feasibility study that will require a Chief of Engineers report and authorization by the U.S. Congress in order to be constructed.

- The total project cost will likely be less than $45 million.

4. Quality Control Plan

The following sections provide details on the required elements of a quality control plan.

a. District Quality Control

All draft products and deliverables will be reviewed by the PDT as they are developed to ensure they meet project and customer objectives, comply with regulatory and engineering guidance, and meet customer expectations of quality all in accordance with MSC and District quality management plans. Informal team reviews, consisting of presentations and discussions of interim documents, shall be documented with meeting minutes.

Appropriate senior staff members from the organizations completing the tasks will also review all technical work before it is submitted forward to the ATR.

Policy and legal reviews will be conducted in accordance with ER 1105-2-100, Appendix H, and may involve the District, MSC, and HQ, as necessary.

b. Agency Technical Review (ATR)

The objective of the ATR is to ensure the product is consistent 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. Products will be reviewed against published guidance, including Engineering Regulations, Circulars, Manuals, Engineering Technical letters and Bulletins. Policy compliance is explicitly within the scope of the ATR as such Policy Guidance Letters, Policy Issue Checklist, issue papers, implementation guidance, project guidance memoranda and any approved waivers are part of the review process. EC 1105-2-410 appendix C, page 4 provides additional review criteria.

Technical reviews were conducted on the reconnaissance report only. A Quality Control Plan was established for the feasibility study but that document does not meet the current ATR requirements as outlined in EC 1105-2-410 and so this RP was developed. ATR, in accordance with EC 1105-2-410, are planned according to Table 2 below.

i. Anticipated Number of Reviewers

The current ATR plan is to include at least 9 agency reviewers. This number is based on the primary disciplines required to develop the decision document.

ii. Review Schedule

The review schedule is presented in Table 2.

TABLE 2.
REVIEW SCHEDULE

Task	Finish Milestone	Status
Submit Working Draft of Decision Document to PCX for ATR of Formulation and Habitat Benefits	18 September 2009	
ATR Comments to District	30 October 2009	
Additional Sampling, Testing, Risk Assessment Efforts Completed	15 October 2009	
Submit Revised Draft Decision Document to PCX	15 December 2009	
ATR Comments to District	30 January 2010	
ATR Comments Incorporated; Draft Decision Document Complete	15 March 2010	
NAD/HQ Review	15 May 2010	
Final Decision Document Complete for ATR Review	15 July 2010	
Final Decision Document Complete for NAD/HQ Concurrence	30 August 2010	
NAD/HQ Review Complete	30 October 2010	
Final Decision Document Approval	15 November 2010	
EA/FONSI Released for Public Review and Comment	1 December 2010	

iii. Primary Disciplines and Expertise Needed for ATR

The disciplines and expertise required for the ATR team are presented in Table 3. This information will be updated as the study progresses. The ATR Team will be selected on the basis of having the proper knowledge, skills, and experience necessary to perform the task and their lack of affiliation with the development of the interim report and associated appendices. The review team will be from outside New England District and the ATR leader will be outside the MSC. The review team will be selected and approved by the Ecosystem Restoration Center of Expertise to ensure that the technical work and products from evaluation, civil engineering, cost estimating (to be conducted by Cost Engineering DX in Walla Walla District), and real estate achieve a quality product. The interim report focuses on the restoration of Fisherville Pond through a combination of traditional excavation, limited capping, and planting methods. All of the disciplines listed are familiar with the analyses used to conduct the investigation and are further described below. All ATRs will be completed using DRCHECKS.

TABLE 3.
AGENCY TECHNICAL REVIEW TEAM

Discipline	Name	Office/Agency
ATR Lead	Sue Ferguson	CELRN-PM-P
Environmental Scientist/Restoration Specialist		
Human Health Risk Assessor		
Cultural Resources		
Economist		
Civil Engineer		
Hydraulic Engineer		
Geotechnical Engineer		
Cost Engineer		
Real Estate		

Plan Formulation

The reviewer (could be handled by the ATR Lead) should have the ability to review the planning process which should address the Nation's water resources needs in a systems context and explore a full range of alternatives in developing solutions. The reviewer should thoroughly understand the Planning Guidance Notebook (ER-1105-100) and the Water Resources Council's Principals and Guidelines.

Environmental Science/ NEPA Compliance

The reviewer should be able to addresses the integration of environmental evaluation (e.g., HEP procedures, sediment chemistry characterization) and compliance requirements, pursuant to national environmental statutes, applicable executive orders and other Federal planning requirements, into the planning of Civil Works water and related land resources comprehensive plans and implementation projects.

Risk Assessment

The reviewer should be experienced in all phases of risk assessment including project strategy, model development, data collection approaches, and decision making.

Cultural Resources

The reviewer needs to be familiar with Section 106, National Historic Preservation Act (NHPA), compliance as it relates to prehistoric sites and historic archaeological structures. Fisherville Pond is part of the Blackstone Valley National Heritage Corridor; the birthplace of the American Industrial Revolution.

Economics

The reviewer needs to be familiar with the incremental analysis of ecosystem restoration projects.

Civil Engineering

The reviewer needs to be familiar with developing quantities for excavating river sediments using limited survey information. An understanding of denil fishways would be helpful as well.

Hydrology & Hydraulics

The reviewer should have the ability to address river hydraulics and sediment transport, planning analysis, water control measures for construction, and conceptual design of denil fishways.

Geotechnical Engineering

The reviewer needs to be familiar with the design of streambank stabilization measures and construction techniques required for the excavation of a dewatered pond.

Cost Estimating

The reviewer must possess a working knowledge of constructing environmental restoration projects and be familiar with dewatering measures, excavation of dewatered ponds, temporary construction roads, hauling and disposal of sediments, plantings, and denil fishway construction.

Real Estate

The reviewer needs to be familiar with Real Estate Plans for ecosystem restoration projects. The REP lists gross appraisals of the costs of lands required for economic evaluations and construction of alternative plans.

iv. Funding for ATR.

The ATR is preliminarily estimated to cost about $40,000 (1 week effort per reviewer). Once the review team is identified a final budget estimate will be developed and coordinated through the PCX and the ATR team.

c. Independent External Peer Review.

Independent External Peer Review 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. External Peer Review is conducted by nationally recognized technical experts outside of the Corps of Engineers. The Independent External Peer Review panel will be established by the responsible PCX through contract with an independent scientific and technical advisory organization.

The scope of the review will address all underlying planning, engineering, including safety assurance, economics, and environmental analyses performed, not just one aspect of the project. The IEPR panel will use appropriate analytical methods for each technical section. The panel will meet with the study PDT and the public to determine areas of controversy in the decision document. If determined necessary, the panel will tour the study area and interview participants as needed.

i. Independent External Peer Reviewers.

The decision document does not include any influential scientific information; the restoration plan will not have significant environmental, social, or economic effects; it is not controversial; nor has the study generated significant interagency interest. Therefore, it has been determined that no IEPR will be necessary.

5. Public Review Opportunities

Public recommendation or selection of ATR or other reviewers is not anticipated at this time. The review plan will be posted on the district internet site and any comments received will be considered by the team.

Any review comments provided to date by individuals or agencies (several public meetings have occurred over the years) have been included in the decision document. A formal public comment period on the decision document will occur at the time of the Division Engineer's public notice. Comments resulting from the public review period will be provided to the ATR team for their review.

6. In-Kind Services

The local sponsor can be credited up to $365,000 in in-kind services according to the FCSA for the entire Blackstone River Watershed Study. This can be composed of: public involvement ($21k), inventory of restoration opportunities ($73k), phytoremediation studies ($68.8k), fish studies ($15.7k), hydrologic and hydraulic

studies ($155k), dam inventories ($10.5k), and study management ($21k). Many of these efforts have already gone through District Quality Control review and been credited to the sponsor prior to the establishment of the RP. The only in-kind credit given that was directly linked to the interim report at Fisherville Pond was the phytoremediation studies. This work determined that late season removal of natural biomass from Fishersville Pond would remove only a small proportion of metals relative to the reserve of metals likely to be in the soil. Therefore, the use of phytoremediation techniques as a restoration tool was dropped from further consideration and no further ATR of this effort is required.

The one remaining effort of significance that could be reviewed during ATR, in addition to District Quality Control review, is the hydrologic and hydraulic studies. These are water quality and sediment loading computer modeling studies being conducted by the sponsor. They are not completed yet and the District was hoping to use the results of these efforts to determine if reestablishing Fisherville Pond will have detrimental water quality effects and to determine future sediment loads to the pond. In the absence of this information, we utilized historical information to make these estimations.

Attachment
Guilds and Models Included in the Fisherville HEP Analysis.

Guild	Representative Species or Model	Reference	Habitat Type(s) Evaluated by Model			
			OW & SAV	EM	WM	SS/ FO
Fish (lentic)	Riverine Habitat	ACOE 2005	•			
Fish (lotic)	Lacustrine Habitat (largemouth bass)	ACOE 2005	•	•		
Benthic Invertebrates	Sediment Quality	Ingersoll et al. 2000	•	•		
Waterfowl	Dabbling Ducks	ACOE (this study)	•	•		
Wading Birds	Green Heron	PAM HEP 1994		•		
Song Birds	Redwing Blackbird	PAM HEP 1994			•	
Song Birds	Wood Cock	PAM HEP 1994				•

Description of Models (excluding the PAM HEP Models)

a. Fish (Riverine)

This model was adapted from ACOE (2005). It includes a qualitative evaluation of general habitat criteria that are necessary to support a warmwater riverine fish community. The following factors are included in the model:

SIV1: Dissolved Oxygen. Dissolved oxygen is required for all aquatic life. Water quality criteria for many freshwater fish species require a level of at least 5 mg/L, below which they begin to show signs of stress.

SIV2: Turbidity. Excessive turbidity in the form of suspended solids is detrimental to maintaining healthy aquatic life. Generally, excessive turbidity (resulting from high levels of suspended solids) can destroy benthic organisms preyed upon by many fish species at various life stages, by suffocation as well as covering over their sandier habitat. This can negatively affect the fisheries by eliminating the food supply of fish larvae and adults. In addition, high levels of turbidity in the form of suspended solids

can directly suffocate fish eggs and larvae, as well as irritate the gills of all life stages of most fish species. This can also lead to stress and/or suffocation. In addition, many fry and juvenile fish species feed primarily by sight, and elevated turbidities can significantly reduce visibility in the water column.

SIV3: Temperature. Stream temperature has a major influence on the growth and survival of riverine fish. Fish have specific thermal tolerances (Coker et al., 2001). Temperature tolerance may vary with life stage (USEPA, 1986).

SIV4: Benthic Invertebrates. Benthic invertebrates constitute a major food component of many fish species during one or more life stages. Therefore, they are important even to top predators, since many of the fishes that they prey upon (forage species) in turn prey upon smaller benthic invertebrates. Invertebrate production is influenced by on water and sediment quality and habitat structure.

SIV5: Instream Cover. Fish need cover (or structure) in order to hide/holdover during times of inactivity, and predator species will hide while waiting for prey. Smaller fish and/or juveniles need cover in order to hide from larger predators and feed. In addition, most areas of cover also provide substrate for aquatic invertebrates necessary as food items.

SIV6: River connectivity. Lack of barriers to fish migration is important to maintain healthy riverine fish communities and to allow migration of anadromous and catadromous species.

SI values were assigned based on professional judgment. The HSI is the lower of these two values: SIV1 and [(SIV1+SIV2+ SIV3+SIV4+SIV5+SIV6)/6]

b. Lacustrine Fish (largemouth bass)

This model was adapted from ACOE (2005). It includes a qualitative evaluation of general habitat criteria that are necessary to support a warmwater lacustrine fish community, with special consideration given to largemouth bass habitat requirements. The following factors are included in the model:

SIV1: Dissolved Oxygen. Dissolved oxygen is required for all aquatic life. Water quality criteria for many freshwater fish species require a level of at least 5 mg/L, below which they begin to show signs of stress.

SIV2: Turbidity. As discussed above, excessive turbidity in the form of suspended solids is detrimental to aquatic life. Largemouth bass are adversely affected by

high levels of turbidity, which interfere with reproductive processes and reduce growth (Stuber et al, 1982).

SIV3: Temperature. Temperature has a major influence on the growth and survival of lacustrine fish. Water in lakes and impoundments often has long hydraulic residence time, which allows for warming of water during the spring and summer months (particularly in the surface layers). Although this can be detrimental to coldwater fish species, it can be beneficial to many warmwater fish species such as largemouth bass (particularly young of year) by increasing growth/metabolic rates (assuming that food is not limiting).

SIV4: Benthic Invertebrates. Benthic invertebrates constitute a major food component of many fish species during one or more life stages. Therefore, they are important even to top predators, since many of the fishes that they prey upon (forage species) in turn prey upon smaller benthic invertebrates. Invertebrate production is influenced by on water and sediment quality and habitat structure.

SIV5: Cover. Fish need cover (or structure) in order to hide/holdover during times of inactivity, and predator species will hide while waiting for prey. Smaller fish and/or juveniles need cover in order to hide from larger predators and feed. In lakes and impoundments cover is frequently provided primarily by vegetation, submerged rocks, logs, and debris can also provide cover. Cover also provides substrate for aquatic invertebrates necessary as food items. Too much cover provided by submerged aquatic vegetation can be deleterious to fish movements and foraging efficiency and adversely effect dissolved oxygen levels (factor 1).

SI values were assigned based on professional judgment. The HSI is the lower these two values: SIV1 and [(SIV1+SIV2+ SIV3+SIV4+SIV5)/5]

c. Benthic Invertebrates

The benthic invertebrate community includes a wide array of organisms living in close association with the sediments. Many of these organisms burrow into sediments, while others live at the sediment water interface. Due to their direct exposure to surface sediments, benthic invertebrates are a key indicator species when evaluating the potential effects of sediment-associated contaminants.

One of the primary goals of this evaluation was to consider the potential habitat benefits associated with reducing sediment contamination. However, although there are diversity indices with which to evaluate the relative health of an ecological community, there are currently no available HSI models for evaluating habitat quality. Therefore, it was necessary to develop an approach for calculating HSIs for this guild. The approach described below is similar to the one used for the Muddy River Project, in Boston, MA

(USACE, 2003). The Muddy river study used a sediment quality model developed by Ingersoll et al (2002) to predict sediment toxicity to invertebrates from sediment chemistry data.

The benthic HSI is defined as simply the ratio of predicted survival compared to predicted survival at a reference location:

$$HSI_{Loc\ x} = \frac{\text{Predicted Survival Location x}}{\text{Predicted Survival at Reference Location}}$$

A variety of physical and chemical factors (*e.g.*, sediment chemistry, grain size, TOC, substrate, water quality, etc.) may contribute to the percent survival of benthic invertebrates observed in a toxicity bioassay. The research of MacDonald *et al.* (2000) and Ingersoll *et al.* (2000) found that sediment toxicity could be predicted in freshwater system through the use of a sediment effects ratio described as a Probable Effects Concentration Quotient (PEC-Q).

As described by MacDonald *et al.* (2000) and Ingersoll *et al.* (2000), the PEC-Q is derived by a three-step process developed by Long *et al.* (1998). In the first step, the concentration of each chemical in a given sample is divided by its respective sediment quality criteria, in this case defined as a Probable Effects Concentration (PEC) as derived by MacDonald *et al.* (2000). The resulting ratio is defined as a PEC quotient or PEC-Q. The PEC-Qs for each chemical are then summed and divided by the number of individual chemicals evaluated to derive a mean PEC-Q for each sample. Derivation of the mean PEC-Q facilitates comparisons between stations, particularly in situations where differing numbers of chemicals have been evaluated. Based on a sample size of 175, MacDonald *et al.* (2000) found that the incidence of toxicity in freshwater sediments could be accurately predicted through use of the mean PEC-Q.

Ingersoll *et al.* (2000) further evaluated this relationship, exploring different methods of deriving the mean PEC-Q. They found that the best predictive relationship was associated with mean PEC-Qs calculated by equally weighting the contribution of metals, PAHs and PCBs in the evaluation of sediment chemistry and toxicity. Specifically, they calculated the geometric mean of the average PEC-Q associated with the metals, the PEC-Q with total PCBs and the PEC-Q associated with total PAHs. The geometric mean of the three PEC-Qs was used in place of the arithmetic mean based on the assumption that it provides a better measure of central tendency. The PEC-Qs derived for each sample were evaluated in comparison with the percent toxicity observed in chronic (*i.e.*, 28 to 42 days) tests conducted with the amphipod *Hyallela azteca*. The results indicated a strong predictive relationship (r^2=0.79).

To calculate HSI values for benthic invertebrates in the Fisherville Study Area under existing and future conditions, mean PEC-Qs were generated for the North Pool, South Pool, Central Pool, and riverine habitat.

The model was validated by comparing predicted 10 day *Hyallela* survival with observed 10 day *Hyallela* survival in 1999 testing of Fisherville Pond and Lake Wildwood sediment (Figure 4). Predicted and observed toxicity were significantly correlated ($r = 0.74$; $r^2 = 0.54$, $p < 0.003$). Predicted survival was usually lower than observed survival. PEC-Qs for PAHs and metals were significantly correlated with *Hyallela* survival in the 10 day toxicity tests.

PEC-Q	Correlation Coefficient	p Value
PAHs	0.69	< 0.01
PCBs	0.52	<0.10
Metals	0.60	<0.02

d. Dabbling Duck.

No suitable single species HEP model was available for the dabbling duck guild. Habitat requirements for waterfowl (Payne, 1992), mallard duck (DeGraaf and Yamasaki, 2001) and habitat models available for mallard in the Midwest (Stafford et al, 2007), wintering black duck (USFWS, 2001) and American Coot (Allen, 1985), and a waterfowl/avian wetland species model (ACOE, 2005) were reviewed. Based on this information a habitat model for dabbling duck at Fisherville was developed. The model includes 3 variables:

SIV1: Percent of wetland basin (emergent and open water habitat) dominated by persistent emergent herbaceous vegetation. A 50:50 ratio is considered optimal. The water depth of emergent habitat is $\leq$18". This depth encompasses the depth range of most emergent plants and is also considered optimal for foraging by mallard duck. Areas dominated by emergent vegetation but without standing water are excluded.

SIV2: The edge index. Areas with a greater interspersion of open water and edge habitat are considered more valuable for waterfowl. The edge index is defined as:

$$\frac{\sqrt{P}}{2\sqrt{A\pi}}$$

Where P = length of edge and A = area of open water.

SIV3: Water regime. The value to waterfowl strongly depends on the presence of surface water. Suitability index was assigned based on seasonal occurrence of surface water.

The HSI is equal to [(S1+S2)/2]*S3

Degradation Factors for Habitat Models

The HEP process provides a methodology that allows planners to incorporate a Relative Value Index (RVI) to account for special site-specific and/or habitat considerations. Accordingly, it was decided that indices should be applied to the habitat models to account for three factors: soil and sediment contamination, contaminant levels in fish tissue, and the occurrence of the invasive plant Phragmites australis.

a. Sediment and Soil Quality

To account for these potential impacts of sediment and soil quality on wildlife health, habitat units (HU) for heron, red wing blackbird, and wood cock were modified by a RVF or degradation factor representing potential risk associated with exposures to contaminated sediment through the ingestion of prey. As defined, the degradation factors are inversely related to the risk (*i.e.*, hazard quotient) calculated for each species evaluated (*i.e.*, the higher the risk, the lower the degradation factor and resulting HU).

Degradation factors used in the analysis were based on the 2003 Ecological risk assessment by Battelle. Risk to wildlife was ranked as high, medium, or low for the South, Central, and North pools based on calculated hazard quotients. Table 7 shows how degradation factors were assigned to risk rankings.

b. Concentration of Contaminants in Fish Tissue

As described in the Risk Assessment (Appendix J), tissue residues were measured in fish collected from throughout the study area. At Fisherville fish were collected from the North, Central, and South pools and an East Pool area latter merged with the South Pool. Fish were also collected from Singing Pond (upstream of Fisherville Dam) and Lake Wildwood (a reference location). For each designated area, average fish tissue concentrations were calculated and compared to a range of literature-based effects values. Specifically, concentrations of metals and PCBs in fish tissue from effects concentrations developed from data reported in the Environmental Residue and Effects Database (ERED). For the purpose of this evaluation, a low effects criterion (Fish effect range-low or FER-L) was defined as the 10th percentile of all whole body concentrations reported in

ERED for freshwater fish species that were associated with an adverse effect. The probable effects criteria (Fish effect range-median or FER-M) was defined as the median (50^{th} percentile) of these same data. Using these criteria, each area was scored as follows:

- Low: Areas where the average whole body tissue concentrations of all COPCs were less than the FER-L.
- Medium: Areas where the average whole body tissue concentrations of one or more COPCs exceed the FER-L, but all are below the FER-M.
- High: Areas where the average whole body tissue concentrations of at least one COPC exceeds the FER-M.

Concentrations of contaminants in fish tissue at Fisherville Pond (South and Central pools) were elevated relative to Lake Wildwood. When compared to the scoring criteria, total PCBs in Fisherville Pond-Central Pool and Fisherville Pond-South Pool was the only contaminant that that exceeded the FER-L. None of the tissue concentrations exceeded the FER-M. Based on these results, Fisherville Pond-North Pool, and Lake Wildwood were ranked as low, while Fisherville Pond-Central Pool and Fisherville Pond-South Pool were ranked as medium. For the Fisherville HEP analysis, a degradation factor was included which reduces the fish habitat value of unexcavated or uncapped areas of the Central and South Pools by 25 percent.

c. Phragmites

Based on published scientific literature/research the ecological value of *Phragmites* dominated habitats is much lower relative to other habitats. However, the marsh wren readily utilizes *Phragmites* habitats (Burger 1985, Picman *et al.* 1993) and therefore may over represent the importance of this cover type to the overall wildlife community. Although *Phragmites* habitats may provide nesting and escape cover for marsh wrens (Burger 1985, Picman *et al.* 1993) and other birds, such as red-winged blackbirds, these plants are invasive, aggressive exotics that eventually lead to habitat homogeneity and reduction in biodiversity relative to other habitats (Burger *et al.* 1982, Craig and Beal 1992, USACE 1998b, and Benoit and Askins 1999). A thorough review of scientific literature relating to *Phragmites* expansion and the ecological/biological impacts of *Phragmites* on an ecosystem indicated that *Phragmites* has significant negative impacts on wetland ecosystems. Specifically, 81 percent of the papers reviewed found negative impacts associated with *Phragmites* dominated communities.

Based on the documented negative impacts of *Phragmites* on bird species, it was determined that an RVI of 0.75 should be applied to the *Phragmites* cover type HSI value for red winged blackbird and woodcock.

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Review Plan Checklist
For Decision Documents

Date: 29 May2009
Originating District: New England District
Project/Study Title: Blackstone River Watershed Investigation, Interim Report - Fisherville Pond
PWI #: 013279
District POC: Chris Hatfield
PCX Reviewer: Sue Ferguson

Please fill out this checklist and submit with the draft Review Plan when coordinating with the appropriate PCX. Any evaluation boxes checked 'No' indicate the RP may not comply with ER 1105-2-410 (22 Aug 2008) and should be explained. Additional coordination and issue resolution may be required prior to MSC approval of the Review Plan.

REQUIREMENT	REFERENCE	EVALUATION
1. Is the Review Plan (RP) a stand alone document?	EC 1105-2-410, Para 8a	Yes ☒ No ☐
a. Does it include a cover page identifying it as a RP and listing the project/study title, originating district or office, and date of the plan? b. Does it include a table of contents? c. Is the purpose of the RP clearly stated and EC 1105-2-410 referenced? d. Does it reference the Project Management Plan (PMP) of which the RP is a component? e. Does it succinctly describe the three levels of peer review: District Quality Control (DQC), Agency Technical Review (ATR), and Independent Technical Peer Review (IEPR)? f. Does it include a paragraph stating the title, subject, and purpose of the decision document to be reviewed? g. Does it list the names and disciplines of the Project Delivery Team (PDT)?* **Note: It is highly recommended to put all team member names and contact information in an appendix for easy updating as team members change or the RP is updated.*	EC 1105-2-410, Appendix B, Para 4a	a. Yes ☒ No ☐ b. Yes ☒ No ☒ c. Yes ☒ No ☐ d. Yes ☒ No ☐ e. Yes ☒ No ☐ f. Yes ☒ No ☐ g. Yes ☒ No ☐ **Comments:** RP not that long, TOC not necessary Comment 1.b. while a table of contents is a minor issue and approval of the RP is not contingent upon its inclusion, the RP would be longer if there was suffcient discussion of the problems and opportuities and model usage.****Table added response acceptable

2. Is the RP detailed enough to assess the necessary level and focus of peer review?	EC 1105-2-410, Appendix B, Para 3a	Yes ☒ No ☐
a. Does it indicate which parts of the study will likely be challenging?	EC 1105-2-410, Appendix B, Para 3a	a. Yes ☒ No ☐ b. Yes ☒ No ☐
b. Does it provide a preliminary assessment of where the project risks are likely to occur and what the magnitude of those risks might be?	EC 1105-2-410, Appendix B, Para 3a	c. Yes ☒ No ☐ d. Yes ☒ No ☐ e. Yes ☒ No ☐
c. Does it indicate if the project/study will include an environmental impact statement (EIS)? *Is an EIS included? Yes ☐ No ☒* *If yes, IEPR is required.*	EC 1105-2-410 Para 7c & 8f	**Comments:** 2.g. Even though this is an ER project, risk to human life should be discussed because it is restoration of a lake and there could be safety assurance questions. ***Risk to human life discussion added comment resolved.
d. Does it address if the project report is likely to contain influential scientific information or be a highly influential scientific assessment? *Is it likely? Yes ☐ No ☒* *If yes, IEPR is required.*	EC 1105-2-410, Appendix B, Para 4b	
e. Does it address if the project is likely to have significant economic, environmental, and social affects to the nation, such as (but not limited to):	EC 1105-2-410, Para 6c	
• more than negligible adverse impacts on scarce or unique cultural, historic, or tribal resources?	EC 1105-2-410 Para 8f	
• substantial adverse impacts on fish and wildlife species or their habitat, prior to implementation of mitigation?	EC 1105-2-410 Para 8f	
• more than negligible adverse impact on species listed as endangered or threatened, or to the designated critical habitat of such species, under the Endangered Species Act, prior to implementation of mitigation? *Is it likely? Yes ☐ No ☒* *If yes, IEPR is required.*	EC 1105-2-410 Para 8f	

f. Does it address if the project/study is likely to have significant interagency interest? *Is it likely? Yes* ☐ *No* ☒ *If yes, IEPR is required.* g. Does it address if the project/study likely involves significant threat to human life (safety assurance)? *Is it likely? Yes* ☐ *No* ☒ *If yes, IEPR is required.* h. Does it provide an estimated total project cost? *What is the estimated cost: $22,500,000* *(best current estimate; may be a range)* *Is it > $45 million? Yes* ☐ *No* ☒ *If yes, IEPR is required.* i. Does it address if the project/study will likely be highly controversial, such as if there will be a significant public dispute as to the size, nature, or effects of the project or to the economic or environmental costs or benefits of the project? *Is it likely? Yes* ☐ *No* ☒ *If yes, IEPR is required.* j. Does it address if the information in the decision document will likely be based on novel methods, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices? *Is it likely? Yes* ☐ *No* ☒ *If yes, IEPR is required.*	EC 1105-2-410, Para 6c EC 1105-2-410, Appendix D, Para 1b EC 1105-2-410, Appendix D, Para 1b EC 1105-2-410, Appendix D, Para 1b EC 1105-2-410, Appendix D, Para 1b	f. Yes ☒ No ☐ g. Yes ☒ No ☐ h. Yes ☒ No ☐ i. Yes ☒ No ☐ j. Yes ☒ No ☐ **Comments:**
3. Does the RP define the appropriate level of peer review for the project/study?	EC 1105-2-410, Para 8a	Yes ☒ No ☐
a. Does it state that DQC will be managed by the home district in accordance with the Major Subordinate Command (MSC) and district Quality Management Plans?	EC 1105-2-410, Para 7a	a. Yes ☒ No ☐

b. Does it state that ATR will be conducted or managed by the lead PCX? c. Does it state whether IEPR will be performed? *Will IEPR be performed? Yes ☐ No ☒* d. Does it provide a defensible rationale for the decision on IEPR? e. Does it state that IEPR will be managed by an Outside Eligible Organization, external to the Corps of Engineers?	EC 1105-2-410, Appendix D, Para 3a EC 1105-2-410, Appendix B, Para 4b EC 1105-2-410, Para 7c	b. Yes ☒ No ☐ c. Yes ☒ No ☐ d. Yes ☒ No ☐ e. Yes ☐ No ☐ n/a ☒ **Comments:**
4. Does the RP explain how ATR will be accomplished?	EC 1105-2-410, Appendix B, Para 4l	Yes ☒ No ☐
a. Does it identify the anticipated number of reviewers? b. Does it provide a succinct description of the primary disciplines or expertise needed for the review (not simply a list of disciplines)? c. Does it indicate that ATR team members will be from outside the home district? d. Does it indicate that the ATR team leader will be from outside the home MSC? e. Does the RP state that the lead PCX is responsible for identifying the ATR team members and indicate if candidates will be nominated by the home district/MSC? f. If the reviewers are listed by name, does the RP describe the qualifications and years of relevant experience of the ATR team members?* **Note: It is highly recommended to put all team member names and contact information in an appendix for easy updating as team members change or the RP is updated.*	EC 1105-2-410, Appendix B, Para 4f EC 1105-2-410, Appendix B, Para 4g EC 1105-2-410, Para 7b EC 1105-2-410, Para 7b EC 1105-2-410, Appendix B, Para 4k(1) EC 1105-2-410, Appendix B, Para 4k(1)	a. Yes ☒ No ☐ b. Yes ☒ No ☐ c. Yes ☒ No ☐ d. Yes ☒ No ☐ e. Yes ☒ No ☐ f. Yes ☐ No ☐ n/a ☒ **Comments:** ATR team members haven't been selected yet 4.b. While the need for and environmental scientist is mentioned, a discription of whether is is a fisheries biologists or a wetlands specialist or a malocologist is needed to help the PCX select the review team. That holds true for the other disciplines. Also there is not enough description of the alternatives to tell whether an HTRW specialist is needed.

		The capping would lead one to believe there are HTRW issues. ***The RP still needs a statement for each ATR dicipline needed to assist in selection of review team. For example the Civil Engineer needs to be famiiar with concrete or dam safety*****Description added comment resolved. .
5. Does the RP explain how IEPR will be accomplished?	EC 1105-2-410, Appendix B, Para 4k & Appendix D	**Yes** ☐ **No** ☐ **n/a** ☒
a. Does it identify the anticipated number of reviewers?	EC 1105-2-410, Appendix B, Para 4f	a. Yes ☐ No ☐ b. Yes ☐ No ☐
b. Does it provide a succinct description of the primary disciplines or expertise needed for the review (not simply a list of disciplines)?	EC 1105-2-410, Appendix B, Para 4g	c. Yes ☐ No ☐ d. Yes ☐ No ☐ **Comments:**
c. Does it indicate that the IEPR reviewers will be selected by an Outside Eligible Organization and if candidates will be nominated by the Corps of Engineers?	EC 1105-2-410, Appendix B, Para 4k(1) & Appendix D, Para 2a	
d. Does it indicate the IEPR will address all the underlying planning, safety assurance, engineering, economic, and environmental analyses, not just one aspect of the project?	EC 1105-2-410, Para 7c	
6. Does the RP address peer review of sponsor in-kind contributions?		Yes ☒ No ☐
a. Does the RP list the expected in-kind contributions to be provided by the sponsor?	EC 1105-2-410, Appendix B, Para 4j	a. Yes ☒ No ☐ b. Yes ☒ No ☐ n/a ☐
b. Does it explain how peer review will be accomplished for those in-kind contributions?		**Comments:** 6.b. a more through discussion of how the in-kind contributions will be used and whether

		QA will be done and then included in the package for ATR would strengthen the RP*** A statement that the district preformed QC on the sponsor techincal work is still needed. ***Language added Comment Resolved.
7. Does the RP address how the peer review will be documented?		Yes ☒ No ☐
a. Does the RP address the requirement to document ATR and IEPR comments using DrChecks?	EC 1105-2-410, Para 8g(1)	a. Yes ☒ No ☐
b. Does the RP explain how the IEPR will be documented in a Review Report?	EC1105-2-410, Appendix B, Para 4k(13)(b)	b. Yes ☐ No ☐ n/a ☒ c. Yes ☐ No ☐ n/a ☒
c. Does the RP document how written responses to the IEPR Review Report will be prepared?	EC 1105-2-410, Appendix B, Para 4l	
d. Does the RP detail how the district/PCX will disseminate the final IEPR Review Report, USACE response, and all other materials related to the IEPR on the internet and include them in the applicable decision document?	EC 1105-2-410, Para 8g(2) & Appendix B, Para 4l	d. Yes ☐ No ☐ n/a ☒ **Comments:**
8. Does the RP address Policy Compliance and Legal Review?	EC 1105-2-410, Para 7d	Yes ☒ No ☐ **Comments:**
9. Does the RP present the tasks, timing and sequence (including deferrals), and costs of reviews?	EC 1105-2-410, Appendix B, Para 4c & Appendix C, Para 3d	Yes ☒ No ☐
a. Does it provide a schedule for ATR including review of the Feasibility Scoping Meeting (FSM) materials, Alternative Formulation Briefing (AFB) materials, draft report, and final report?	EC 1105-2-410, Appendix C, Para 3g	a. Yes ☒ No ☐ b. Yes ☒ No ☐ c. Yes ☐ No ☐ n/a ☒
b. Does it include interim ATR reviews for key	EC 1105-2-410,	d. Yes ☐ No ☒

technical products? c. Does it present the timing and sequencing for IEPR? d. Does it include cost estimates for the peer reviews?	Appendix C, Para 3g	**Comments:** ATR not selected yet.
10. Does the RP indicate the study will address Safety Assurance factors? Factors to be considered include: • Where failure leads to significant threat to human life • Novel methods\complexity\ precedent-setting models\policy changing conclusions • Innovative materials or techniques • Design lacks redundancy, resiliency of robustness • Unique construction sequence or acquisition plans • Reduced\overlapping design construction schedule	EC 1105-2-410, Para 2 & Appendix D, Para 1c	**Yes** ☐ **No** ☐ **n/a** ☒ **Comments:**
11. Does the RP address model certification requirements?	EC 1105-2-407	Yes ☒ No ☐
a. Does it list the models and data anticipated to be used in developing recommendations (including mitigation models)? b. Does it indicate the certification/approval status of those models and if certification or approval of any model(s) will be needed? c. If needed, does the RP propose the appropriate level of certification/approval for the model(s) and how it will be accomplished?	EC 1105-2-410, Appendix B, Para 4i	a. Yes ☒ No ☐ b. Yes ☒ No ☐ c. Yes ☐ No ☐ n/a ☒ **Comments:** The discussion of the modeling is not adequate to judge whether certification is needed. A more detailed discussion of the inputs and how the models are being used is needed. ***Please add the name of the sediment model used. **** Language added Comment Resolved. *****Addiitonal

		discussion of the models used was added to resolve other PCX comments.
12. Does the RP address opportunities for public participation?		Yes ☒ No ☐
a. Does it indicate how and when there will be opportunities for public comment on the decision document? b. Does it indicate when significant and relevant public comments will be provided to reviewers before they conduct their review? c. Does it address whether the public, including scientific or professional societies, will be asked to nominate potential external peer reviewers? d. Does the RP list points of contact at the home district and the lead PCX for inquiries about the RP?	EC 1105-2-410, Appendix B, Para 4d EC 1105-2-410, Appendix B, Para 4e EC 1105-2-410, Appendix B, Para 4h EC 1105-2-410, Appendix B, Para 4a	a. Yes ☒ No ☐ b. Yes ☒ No ☐ c. Yes ☒ No ☐ d. Yes ☒ No ☐ **Comments:**
13. Does the RP address coordination with the appropriate Planning Centers of Expertise?	EC 1105-2-410, Para 8a	Yes ☒ No ☐
a. Does it state if the project is single or multi-purpose? Single ☒ Multi ☐ List purposes: Fish and wildlife b. Does it identify the lead PCX for peer review? Lead PCX: **ECO** c. If multi-purpose, has the lead PCX coordinated the review of the RP with the other PCXs as appropriate?	EC 1105-2-410, Appendix D, Para 3c	a. Yes ☒ No ☐ b. Yes ☒ No ☐ c. Yes ☐ No ☐ n/a ☒ **Comments:**
14. Does the RP address coordination with the Cost Engineering Directory of Expertise (DX) in Walla Walla District for ATR of cost estimates, construction schedules and contingencies for all documents requiring Congressional authorization?	EC 1105-2-410, Appendix D, Para 3	Yes ☒ No ☐
a. Does it state if the decision document will require Congressional authorization? b. If Congressional authorization is required,		a. Yes ☒ No ☐ b. Yes ☒ No ☐ n/a ☐

does the state that coordination will occur with the Cost Engineering DX?		**Comments:**
15. Other Considerations: This checklist highlights the minimum requirements for an RP based on EC 1105-2-410. Additional factors to consider in preparation of the RP include, but may not be limited to: a. Is a request from a State Governor or the head of a Federal or state agency to conduct IEPR likely? b. Is the home district expecting to submit a waiver to exclude the project study from IEPR? c. Are there additional Peer Review requirements specific to the home MSC or district (as described in the Quality Management Plan for the MSC or district)? d. Are there additional Peer Review needs unique to the project study?	EC 1105-2-410, Appendix D, Para 1b EC 1105-2-410, Appendix D, Para 1d	**Comments:** No further peer review needs known.
Detailed Comments and Backcheck:		