



REPLY TO  
ATTENTION OF

CENWD-PDD

DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, NORTHWESTERN DIVISION  
PO BOX 2870  
PORTLAND OR 97208-2870

29 OCT 2012

MEMORANDUM FOR Commander, Portland District (CENWP-PM-PF)

SUBJECT: Review Plan (RP) Approval for the Mount St. Helens Ecosystem Restoration, Cowlitz County, WA, Feasibility Report

1. Reference EC 1165-2-209, Civil Works Review Policy, 31 January 2010.
2. The enclosed RP for the Mount St. Helens Ecosystem Restoration, Cowlitz County, WA, Feasibility Report has been prepared in accordance with the referenced guidance.
3. The RP has been coordinated with the appropriate Planning Center of Expertise (PCX), the Ecosystem Restoration (ECO-PCX). The ECO-PCX has endorsed approval of the RP.
4. The project team anticipates requesting exclusion from Type I Independent External Peer Review (IEPR) of the Feasibility Report and associated products as it does not currently meet the criteria requiring Type I IEPR in the referenced guidance. The exclusion request would come to NWD and the PCX, and requires the approval from the Director of Civil Works.
5. The RP has been reviewed by NWD. It is consistent with above referenced guidance. There are no outstanding comments.
6. I hereby approve this RP, which is subject to change as the study circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to the RP or its execution will require review by CENWD and approval by this office.
7. The RP should be posted to the District internet site and made available for public comment.
8. Please contact Rebecca Weiss at 503-808-3728, if you have further questions regarding this matter.

Encl

  
ANTHONY C. FUNKHOUSER, P.E.  
COL, EN  
Commanding

## REVIEW PLAN

Mount St Helens Ecosystem Restoration, Cowlitz County, WA  
Feasibility Report

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## 1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the Mount St Helens Ecosystem Restoration, Cowlitz County, WA.

### b. References

- Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011
- Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
- ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
- Mount St Helens Ecosystem Restoration General Reevaluation Study Reconnaissance Report, Jul 2007
- Mount St Helens Ecosystem Restoration Feasibility Study PMP

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 Ecosystem Planning Center of Expertise (ECO-PCX).

The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies.

## 3. STUDY INFORMATION

a. **Decision Document.** The Mount St Helens Ecosystem Restoration Study, located in Cowlitz County, will prepare a Feasibility Study Report. The purpose of the Feasibility Study Report is to document project evaluations and facilitate acceptance of the study conclusions and recommendations by the sponsor, public, state and local agencies, and the federal government. Approval will require a Chief of Engineers' Report and Congressional Authorization for construction. It is anticipated that an Environmental Assessment will be prepared for National Environmental Policy Action (NEPA) documentation and integrated into the Feasibility Report.

**b. Study/Project Description.** The 1980 eruption of Mount St. Helens devastated the fisheries resources in the Toutle River watershed, located primarily in Cowlitz County, Washington. Tributaries to the upper North Fork Toutle River were severely affected as massive landslides and debris flows traveled downstream (Figure 1). Debris flows buried 23 square miles of terrain in the North Fork Toutle River to an average depth of 150 feet, including more than 27 miles of stream habitat for anadromous fish species.

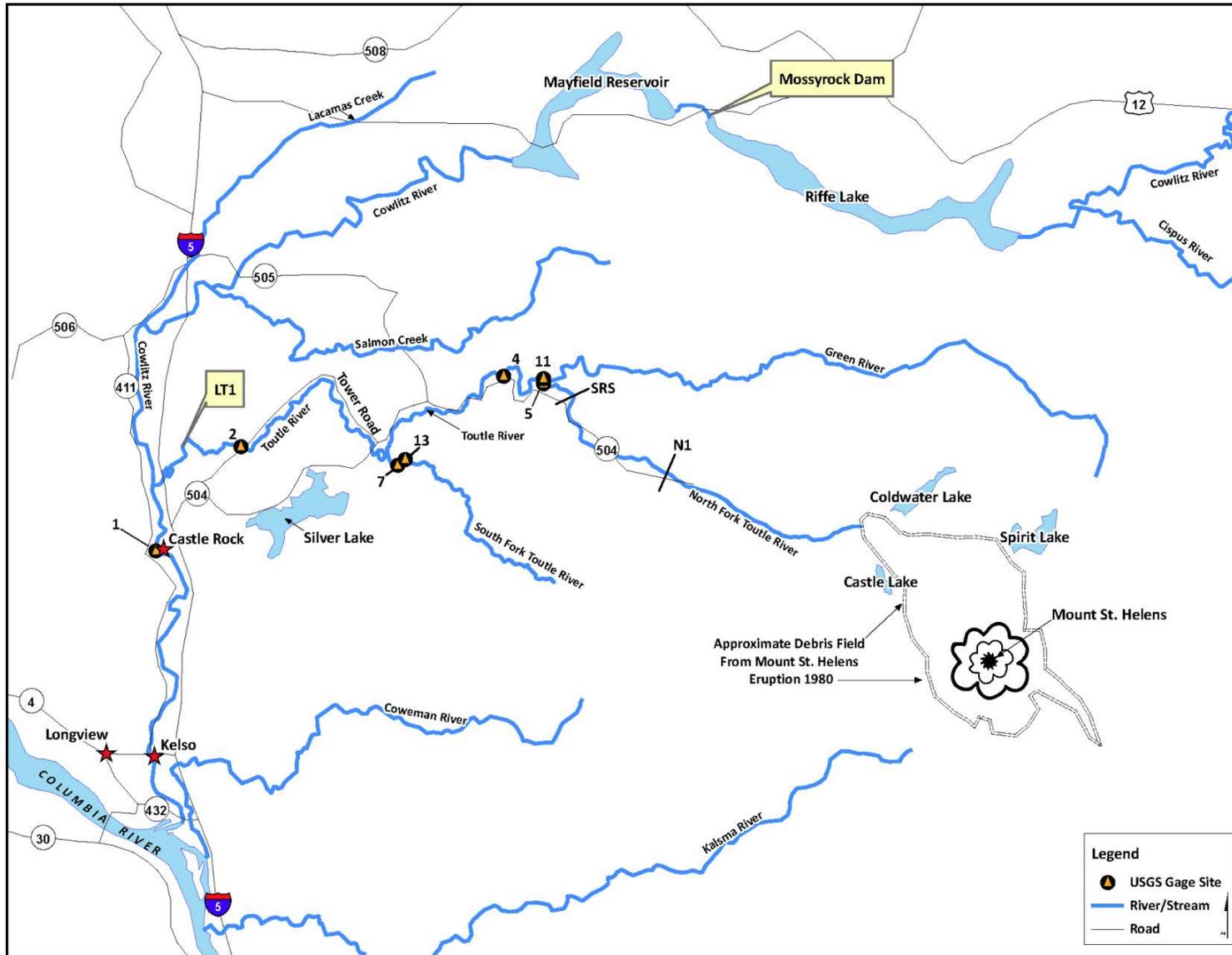
The North Fork Toutle historically supported populations of several salmon species currently listed as threatened under the Endangered Species Act (ESA). These species include winter steelhead (*Oncorhynchus mykiss*), coho salmon (*O. kisutch*), spring and fall Chinook salmon (*O. tshawytscha*), and chum salmon (*O. keta*). The stream reaches with the most restoration potential are located just downstream from the Green River confluence and further upstream on the North Fork Toutle River above and below the U.S. Army Corps of Engineers' (USACE) Sediment Retention Structure (SRS), located at river mile (RM) 13.2 .

Upstream volitional fish passage is currently blocked just upstream of the Green River confluence by the constructed barrier associated with the Washington Department of Fish and Wildlife (WDFW) fish collection facility (FCF) and the SRS. The SRS was constructed to retain eruption-related sediments and is a source of fine sediment to the lower river. The FCF, located just downstream of the SRS, was constructed as mitigation for the SRS and its ownership was turned over to the WDFW in the 1990s. In addition, the ongoing erosion of material upstream of the SRS that moves through the structure has interfered with operation of the FCF. Currently, the WDFW traps fish at the FCF and transports them by truck to tributary release sites upstream of the SRS. Fish are able to migrate downstream volitionally.

In addition, the Mount St. Helens Wildlife Area, established in 1990, is located on the valley floor (sediment plain) along the North Fork Toutle River between the Mount St. Helens Volcanic Monument and the SRS. The wildlife area was acquired by the WDFW to be managed as elk winter range. However, much of the winter range area remains buried in sediment. Areas where sediment has accumulated are largely unvegetated and unstable. Additional problems occur when the sediments erode at low flows.

Erosion and sediment movement into the North Fork Toutle River watershed continues to be significant and unpredictable. Consequently, there is significant risk associated with investing in ecosystem restoration measures due to the instability of the North Fork Toutle River drainage and continuing sedimentation effects caused by the 1980 eruption. In addition, implementing any restoration actions must be fully integrated with the need to maintain long-term flood risk management for the communities along the lower Cowlitz River. Specifically, USACE is responsible for the ongoing sediment monitoring and analyses work for flood risk management in the lower Cowlitz River through 2035.

Figure 1. Mount St. Helens and Vicinity



## **Project Vision**

The vision for this project focuses on developing actions to improve access/upstream tributary habitat for ESA-listed salmonids and improve aquatic related features of wildlife (elk) habitat in the North and South Fork Toutle watershed. The eruption of Mount St. Helens and its aftermath created barriers for salmonid migration and passage and limited access to their upstream tributary habitats. Restoring volitional access and passage to upstream tributary habitats would increase the viability of ESA-listed salmon and steelhead in the watershed and would result in an increase in adult salmonid productivity. Actions to restore habitat could also include erosion control, riparian planting, and control of noxious weeds.

## **Background**

The Toutle River watershed encompasses about 512 square miles primarily in Cowlitz County, with some tributaries in Lewis and Skamania counties (see Figure 1). The Toutle River enters the Cowlitz River at RM 20, just north of Castle Rock. Elevations range from near sea level at the mouth to over 8,000 feet at the summit of Mount St. Helens. The Toutle River drains the north and west sides of Mount St. Helens and flows generally westward towards the Cowlitz River. The watershed contains three primary drainages: North Fork Toutle River, South Fork Toutle River, and Green River. Most of the North Fork and South Fork Toutle rivers were severely impacted by the 1980 eruption of Mount St. Helens and the resulting massive debris torrents and mudflows.

Lateral blast and mudflow deposits from the eruption produced immediate and long-term effects on the hydrology of the Toutle watershed by changing the land cover and runoff characteristics. The debris avalanche resulting from the eruption deposited approximately 3.8 billion cubic yards of silt, sand, gravels, and trees in the upper 17 miles of the North Fork Toutle River. Lateral blast and mudflow deposits also dramatically affected the South Fork Toutle River. In addition, the sediments eroded from the debris avalanche have dramatic downstream impacts on the Toutle, Cowlitz, and Columbia rivers. The excess sediment deposited downstream in the lower Toutle, Cowlitz, and Columbia rivers reduced the channel capacities of these rivers. This left the communities of Castle Rock, Lexington, Kelso, and Longview in Washington with the potential of major flooding even with normal runoff. Emergency measures were implemented by USACE under authority of Public Law 99-88 (August 15, 1985) and interim flood control measures were implemented under authority of Public Law 98-63 (July 30, 1983). Temporary debris or check dam type structures were constructed across the North Fork and South Fork Toutle River to immediately reduce the volume of sediment delivered to the Cowlitz, levees were raised along the lower Cowlitz River to prevent flooding, and the Columbia River was dredged to eliminate the threat to navigation.

Long-term sediment control facilities were constructed under Supplemental Appropriations Act of August 15, 1985 (Public Law 99-88). The project was designed to have a life of 50 years from 1985 through 2035. Project performance projections and proposed modifications were made for the time period ending in the year 2035. USACE was authorized to construct and operate a SRS near the confluence of the Toutle and Green rivers. The SRS was constructed to allow downstream fish passage but is currently a barrier to upstream migrating adult salmonids. The SRS totally blocked upstream volitional access to as many as 50 miles of upstream habitat for anadromous fish and potential loss of connectivity of some of the smaller tributaries above the SRS to the North Fork Toutle.

The SRS consists of an earthen dam that is 125 feet above the original streambed and 1,800-feet long, with a concrete outlet works and a spillway at its north end. The SRS spillway is 2,200-feet long and 400-feet wide and has an unlined, rough-bed channel with a 7% gradient. Since 1987, the SRS has prevented an enormous quantity of sediment from traveling down the North Fork and into the Toutle, Cowlitz, and Columbia rivers. An estimated 105 million cubic yards of sediment have settled out in the 4-mile long reach upstream of the SRS. The design of the SRS anticipated that in the future, the outlet structure through which water and fish exited to the channel below would become closed off due to sediment infill behind the structure. This occurred in 1998 and the North Fork Toutle River now flows over the SRS spillway. This change in condition provides the potential to provide for volitional upstream fish passage through the SRS to valuable upstream habitat and eliminate the problems associated with collecting and trucking the fish to upstream release sites.

High flows in 1996 damaged the SRS spillway and caused a 6-foot vertical drop (falls) at the downstream end of the spillway. In response to the damage, USACE constructed a weir 1,000 feet downstream of the crest to prevent down-cutting, and made minor structural repairs to the spillway. Currently, water flows through a series of high-velocity cascades and depending on flow levels, over shallow sheet-flow areas before ending in the 6-foot vertical drop at the spillway's downstream end. The water continues downstream through a combination of riffles, runs, and cascades and over a concrete velocity barrier at the FCF before merging with the Green River.

As mitigation for the SRS, a trap-and-haul FCF was funded and constructed by USACE on the North Fork Toutle River 1.3 miles downstream from the SRS to facilitate fish passage. Ownership of the FCF was turned over to the State of Washington (WDFW) to operate and maintain. Adult steelhead and coho salmon are collected at the FCF. Fish are collected by diverting a portion of the river above the FCF into a fish ladder. Fish are attracted by this flow into the ladder and move up into a collection pond. Fish are then moved into transport tanks on trucks and taken to two upstream release locations (Hoffstadt and Alder creeks). Transported fish are released randomly in each stream without knowledge of their stream of origin. Large sediment volumes in the North Fork Toutle River have contributed and continue to contribute to operational problems at the FCF.

The 1980 eruption had the greatest impact on the North Fork Toutle River watershed, which received the majority of the debris avalanche deposit. The Green River and South Fork Toutle River watersheds were affected by mudflow deposits. The effects of lateral blast and volcanic deposits altered the landscape characteristics of the three watersheds and changed their hydrologic characteristics. These effects were seen by increased peak streamflow that affected autumn and winter peaks for a period of 5 years post eruption. A qualitative assessment of sediment deposition impacts to tributaries of the North Fork Toutle above the SRS is shown in Table 1.

**Table 1. Sediment Deposition Impacts to Tributaries of the North Fork Toutle River**

| Stream       | Sediment Deposition Impacts  |
|--------------|--|
| Pullen Creek | Deposition has caused a lake to form downstream, severing connection with North Fork Toutle.   |
| Alder Creek  | Sediment deposition caused a delta to form at confluence. Connection with North Fork Toutle is transient and at times may consist of several smaller channels (braided). |
| Hoffstadt    | Currently maintaining stable connection to North Fork Toutle. Second   |

| Stream     | Sediment Deposition Impacts   |
|------------|---|
| Creek      | confluence forms upstream at high flows from the North Fork Toutle.   |
| Bear Creek | Connected to Hoffstadt Creek and affected by changes downstream at Hoffstadt-North Fork Toutle confluence; may serve as a high flow channel of the North Fork Toutle. |
| Deer Creek | Within sediment deposition impacts reach; specific conditions were not identified.  |

**Previous Studies**

Since the 1980 eruption, efforts have been undertaken and are ongoing related to erosion and sediment management, flood risk management, wildlife habitat, and fish passage/habitat issues. The major efforts completed by USACE and other agencies and groups that are pertinent to ecosystem restoration were summarized in the Reconnaissance Report (Corps 2007). The Mount St. Helens Information Database is a more comprehensive accounting of data and information sources related to sediment, fish, and habitat restoration and was developed by Steward and Associates for USACE. The database can be found in Appendix B of the Reconnaissance Report (Corps 2007).

**Study Authority**

The Water Resources Development Act of 1999 (Public Law 106-53, August 17, 1999) states “The Secretary shall conduct a study to determine the feasibility of undertaking ecosystem restoration improvements throughout the Cowlitz and Toutle River basins, Washington, including the 6,000 acres of wetland, riverine, riparian, and upland habitats lost or altered due to the eruption of Mount St. Helens in 1980 and subsequent actions.”

The Energy and Water Development Appropriations Act of 2006 (Public Law 109-103, November 19, 2005) provided funding for the Chief of Engineers, “. . . to conduct a General Reevaluation Study on the Mount St. Helens project to determine if ecosystem restoration actions are prudent in the Cowlitz and Toutle watersheds for species that have been listed as being of economic importance and threatened or endangered” (119 Stat. 2249).

**Sponsorship**

The non-federal sponsor for the feasibility phase of the Mount St. Helens ecosystem restoration study is the State of Washington through the Washington Department of Fish and Wildlife (sponsor).

## Reconnaissance (905 (b)) Phase

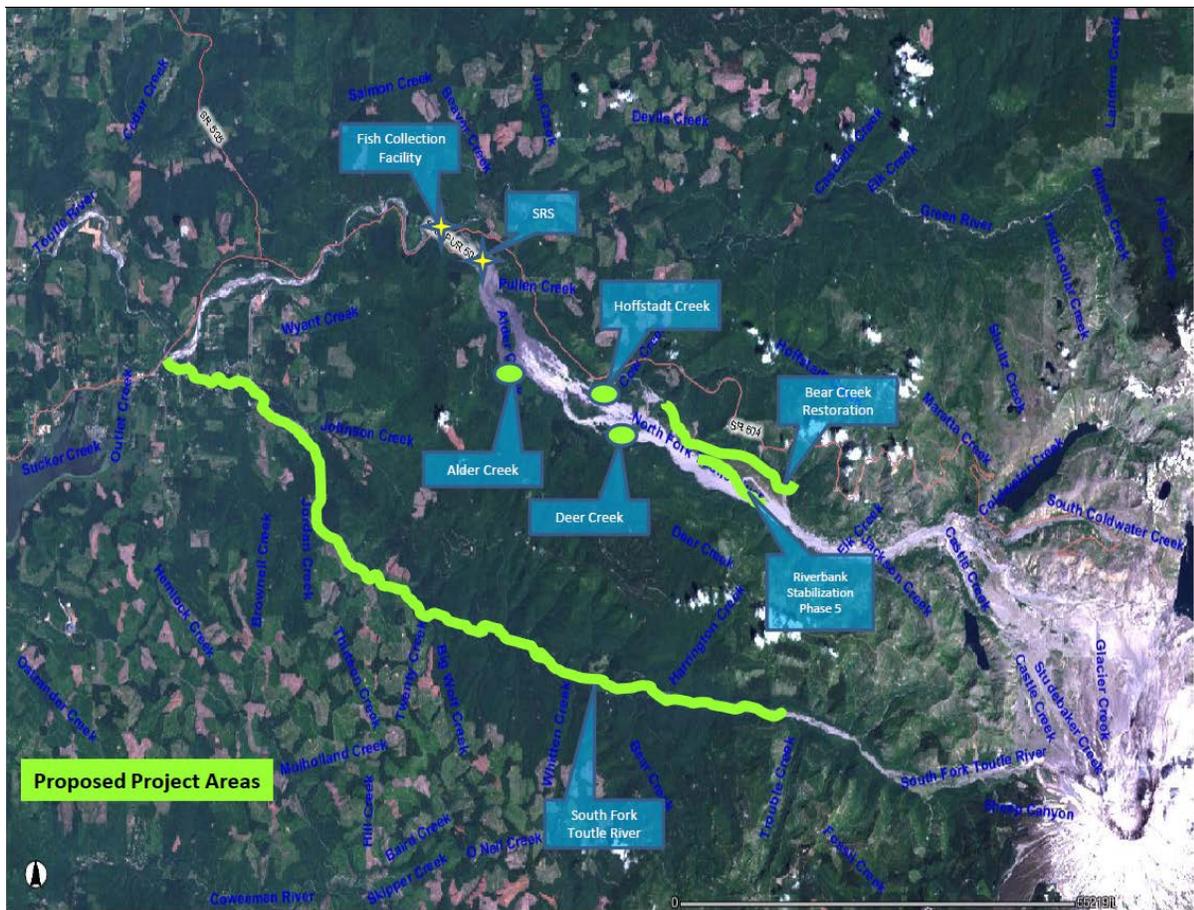
The 2007 Reconnaissance Report (Corps 2007), approved by NWD in 2012, serves as the basis for determining federal interest to complete the feasibility phase study contained in this PMP. The report addressed the existing fish passage limitations in the North Fork Toutle River as related to the trap-and-haul operations at the existing FCF and the inability of the SRS to volitionally pass fish. Connectivity/fish habitat restoration was addressed for the sediment plain upstream of the SRS and for the Toutle River below the SRS. The reconnaissance report identified a range of possible ecosystem restoration measures that could provide benefits to ESA-listed fish species in the Toutle River watershed.

## Feasibility Study Objective

The objective of the feasibility study is to formulate and recommend an ecosystem restoration project in the Toutle River watershed that meets federal criteria for implementation. The ecosystem restoration project will focus on developing actions to restore access/upstream tributary habitat for ESA-listed salmonids and restore elk habitat.

The study will focus on the area depicted in Figure 3.

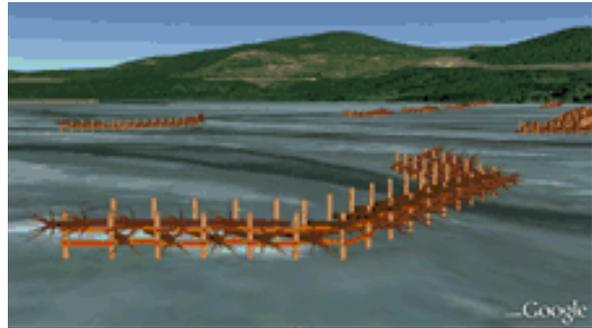
**Figure 2. Study Area**



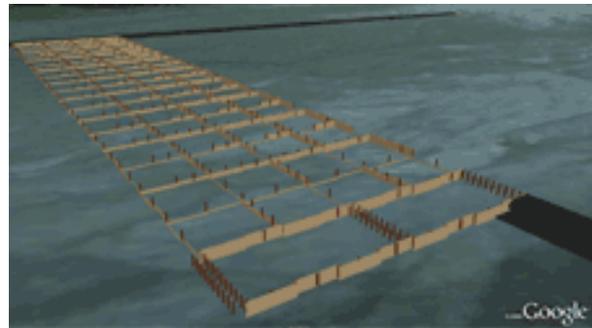
Types of measures/alternatives to be considered

Measures or alternatives investigated in the reconnaissance report included grade building structures. These structures were included in a pilot project as described below:

Island Forming Structures. Also called engineered log jams, this array of 14 structures consists of timber piles driven into the sediment with logs and racking material attached. The structures enhance the capture of woody debris on the sediment plain to induce the deposition of sediment. The semi-hexagonal shape of the structures causes an eddying pattern of flow on the structure's downstream side, where sediment-laden water can slow and deposit material. As a secondary feature, these structures provide a more stable sediment system instead of an active braided plain. The channeling found between the structures would be a self-armored system of channels, with a sustainable "tail" of sediment located behind each structure. This tail may provide a location for plant and animal life to get a foothold, instead of having channels of water destroy struggling plant life year after year.



Cross-valley Structure (CVS). The CVS is intended to be the main feature of sediment retention. The CVS is a system of piles and panels that operate in a cellular weir and baffle configuration. It is about 800-feet long (across the plain) and 160-feet deep (parallel to flow). The structure should induce sediment deposition by forming a pool on the face of the structure, causing sediment to drop out of the water. Also, the cellular configuration deposits sediment in the cells. Fish passage can occur upstream and downstream of the structure because of its tiered construction. The structure stands 5 feet tall at the face (upstream) and becomes shorter at the downstream end with water exiting at grade level. The CVS does not extend across the valley. It is enclosed by a "false valley wall" created by the use of a 6-foot high sediment filled geotextile barrier that extends approximately 1,200 feet long upstream of the structure, parallel to flow. Mimicking the behavior of a valley wall, this barrier creates a separate area for the testing zone apart from a control area on the opposite side.



In addition, channel excavation, placement of large woody debris, and riparian plantings are all anticipated to be measures to consider for implementation in this study; though this is not a complete list of all measures.

It is not anticipated that the total cost of construction of an NER plan resulting from this study will be greater than \$45M.

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

- No parts of the study will likely be challenging as all models identified for use are certified/approved for regional use and are routine and the study area has been subject to ongoing study for more than 30 years;

- Information in the decision document or anticipated project designs is likely to be based on novel methods, involve use of innovative materials or techniques, present complex challenges for interpretation, contain precedent –setting methods or models, or present conclusions that are likely to change prevailing practices as all models identified for use are certified/approved for regional use and are routine and the decision document will use data collected over the period of the last 30 years;
- This will not be a highly controversial study, as the resource agencies and members of the public all support ecosystem restoration at Mount St Helens. Implementation of the Mount St Helens project will provide National Ecosystem Restoration benefits to the Nation, in terms of habitat units. There is no influential scientific information presented in this study, as much of the data used to formulate alternatives was generated by the Mount St Helens Sediment Retention Structure project that has been generating data over the past decade;
- The risks of this project occur mostly in the implementation phase, where risk of not receiving federal and non-federal funds would drive the costs of the project higher and delay the implementation and receipt of benefits to the environment. The risks of the project not performing as designed would result in those environmental restoration improvements not being realized and the Toutle River would retain the existing poor aquatic habitat quality and water quality.
- There is no significant threat to human life or safety as the actions on the North Toutle will be designed and constructed in coordination with the SRS project and will not impact or impede the flood risk reduction performance of the SRS project. The South Toutle Study Area is very remote with little to no local population to be impacted by the project. The alternatives to be analyzed for ecosystem restoration will not be designed to increase potential flood risk from its existing condition;
- There is not a request by the Governor of an affected state for a peer review by independent experts;
- The study is not likely to involve significant public dispute as to the size, economic or environmental cost or benefit, nature, or effects of the project; and
- The alternatives will be designed in such a way as they will be self-sustaining. The redundancy, resilience and/or robustness discussion does not apply to this ecosystem restoration study, as the purpose of this study is to bring natural restoration to the Toutle River.

**d. In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. The in-kind products and analyses to be provided by the non-Federal sponsor include:

- Feasibility Report Hydrology and Hydraulics Appendix
- Feasibility Report Design Appendix
- Feasibility Report Cost Estimate Appendix
- Feasibility Report Environmental Appendix
- Habitat Benefit Quantification Models
- Biological Assessment

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

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan

(PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC.

- a. **Documentation of DQC.** DQC will be documented in DrChecks and a DrChecks report will be provided to the ATR team after each DQC review.

**5. AGENCY TECHNICAL REVIEW (ATR)**

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the designated RMO and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead will be from outside the home MSC.

- a. **Products to Undergo ATR.** In-line with the new Corps planning modernization initiative (SMART Planning), the ATR will be conducted on a “continuous” basis, rather than only at specific milestone points. This means that interim products may be provided to ATR teams for review and comment as they are completed, rather than waiting for a complete milestone report. This approach will allow for issues to be identified and resolved earlier in the study process. Table 2 indicates a preliminary set of interim items to be reviewed along with a tentative schedule. The table is subject to change as the study progresses, both in terms of the schedule as well as the products to be reviewed.

**Table 2. Review Schedule**

| Item   | Discipline              | Scheduled Start | Duration |
|--|-------------------------|-----------------|----------|
| Planning Model Check/Evaluation Criteria             | Planning, Environmental | 29APR13         | 1 week   |
| Prelim Cost Review                                   | Cost DX                 | 14AUG13         | 2 weeks  |
| Agency Decision Milestone (Draft Feasibility) Report | All                     | 26MAY14         | 4 weeks  |

- b. **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 decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc). |
| Planning                     | The planning reviewer should be a senior water resources planner with experience in the plan formulation process. The reviewer should be familiar with evaluation plans for ecosystem restoration projects.   |

| ATR Team Members/Disciplines | Expertise Required   |
|------------------------------|--|
| Economics                    | The economics reviewer should be able to evaluate the appropriateness of cost effectiveness and incremental cost analysis, using IWR-Planning Suite, as applied to dollar costs and ecosystem restoration benefits. The reviewer should also have experience with National Ecosystem Restoration analysis procedures.        |
| Environmental Resources      | The environmental resources reviewer should have particular knowledge of ecosystem restoration, including the methods used to evaluate benefits, and should also be familiar with all NEPA requirements. The reviewer should have experience with anadromous fish biology, preferably experience in the Northwest.           |
| Hydraulic Engineering        | The hydraulic engineering reviewer will have a thorough understanding of the field of hydraulics and of computer modeling application in ecosystem restoration.  |
| Cost Engineering             | The cost engineering reviewer will be familiar with cost estimating for similar projects using MII. The reviewer will be a Certified Cost Technician, Certified Cost Consultant, or Certified Cost Engineer. A separate process and coordination is also required through the Walla Walla District PCX for cost engineering. |

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

- The review concern – identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;
- The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
- 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
- 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.** The study scope was evaluated to determine if mandatory triggers described in EC 1165-2-209 Paragraph 11.d(1) for a Type I IEPR are met:
- Significant threat to human life: the study will not include consideration of construction or modification of features that protect human life and property from flood or storm damage;
  - Estimated total cost greater than \$45M: the reconnaissance report identified restoration alternatives that do not exceed \$20M;
  - Governor request for peer review: the Governor has not requested peer review;
  - Deputy for Civil Works and the Chief of Engineers has determined that the project study is controversial due to significant public dispute: this determination has not been made.

The District will request exclusion from Type I IEPR based on the consideration of risks associated with the study and consideration of the likelihood of significant benefit from IEPR to the study:

- It is not anticipated that the study will result in an Environmental Impact Statement;
- The study purpose includes improving ecosystem conditions for significant tribal resources;
- The study purpose includes improving ecosystem conditions for fish and wildlife species and their habitats;
- The study purpose includes improving ecosystem conditions for species listed as threatened or endangered under the Endangered Species Act of 1973;
- It is not anticipated that non-performance of the recommended plan will result in significant adverse impacts to the ecosystem in the planning area and that the future without project condition will be the outcome in such a case;
- It is not anticipated that non-performance of the recommended plan will have any impact on human life or property safety;
- It is not anticipated that non-performance of the recommended plan will have any socio-economic impact on the local community;
- The study scope does not propose to develop highly influential scientific data but rather will utilize 30 years of data collected in the study area;
- No heads of federal or state agencies have requested an IEPR.

No significant threat to human life is anticipated, and current expectations are that Type II IEPR will not be required. A final determination concerning the requirement/need for a Type II IEPR will be made and documented in the Review Plan that addresses the project design/construction phase.

- 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.

**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.

**9. MODEL CERTIFICATION AND APPROVAL**

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models, for the purposes of the EC, are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

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

| Model Name and Version                                  | Brief Description of the Model and How It Will Be Applied in the Study   | Certification / Approval Status |
|---|--|---------------------------------|
| Chinook Salmon: Habitat Suitability Index Models (1986) | U.S. Fish and Wildlife Service developed models.<br><br>For restoration of large rivers, streams. Applicable for <i>Oncorhynchus tshawytscha</i> from the Ventura River, California to Point Hope, Alaska. | Approved for use                |

| Model Name and Version                               | Brief Description of the Model and How It Will Be Applied in the Study   | Certification / Approval Status |
|--|--|---------------------------------|
|  | One uses simple limiting factor. The second uses a partial compensatory limiting factor theory.  |                                 |
| Coho Salmon: Habitat Suitability Index Models (1983) | U.S. Fish and Wildlife Service developed model.<br><br>For restoration of streams. Applicable for <i>Oncorhynchus kisutch</i> from Monterey Bay, California to Point Hope, Alaska and southward along the Asiatic coast to Japan.<br><br>Model does not take into account the different stocks or subpopulations.  | Approved for use                |
| Beaver: habitat Suitability Index Models (1982)      | U.S. Fish and Wildlife Service developed model.<br><br>For restoration of fresh wetland, lake large river and streams. Applicable for <i>Castor canadensis</i> throughout north America except for peninsula Florida, the Arctic tundra, and the southwestern deserts.<br><br>The food component of this model assumes that woody vegetation potentially may limit the ability of an area to support beavers. Water and food are the only requisites considered. | Approve for use.                |
| IWR Planning Suite with Annualizer v. 2.0.6.0        | U.S. Army Corps of Engineers developed model.<br><br>For all locations where benefits might include non-monetary units of measure.<br><br>Used for cost-effectiveness and incremental cost analyses of projects/plans involving non-monetary units of benefit, and for estimation of annualized (annual average) costs and benefits.   | Certified                       |

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

| Model Name and Version              | Brief Description of the Model and How It Will Be Applied in the Study   | Approval Status          |
|-------------------------------------|--|--------------------------|
| HEC-RAS 4.0 (River Analysis System) | The Hydrologic Engineering Center's River Analysis System (HEC-RAS) program provides the capability to perform one-dimensional steady and unsteady flow river hydraulics calculations. The program will be used for steady flow analysis to evaluate the future without- and with-project conditions along the Wild River and its tributaries. | HH&C CoP Preferred Model |

## 10. REVIEW SCHEDULES AND COSTS

- a. **ATR Schedule and Cost.** Table 2 details the schedule for completing ATRs for this study. ATR costs are detailed in Table 3.

**Table 3. ATR Cost Estimate**

| Item   | Discipline              | Scheduled Start | Cost            |
|--|-------------------------|-----------------|-----------------|
| Planning Model Check/Evaluation Criteria             | Planning, Environmental | 29APR13         | \$2,000         |
| Prelim Cost Review                                   | Cost DX                 | 14AUG13         | \$1,000         |
| Agency Decision Milestone (Draft Feasibility) Report | All                     | 26MAY14         | \$21,000        |
| <b>Total</b>   |                         |                 | <b>\$24,000</b> |

- b. **Type I IEPR Schedule and Cost.** Not applicable.
- c. **Model Certification/Approval Schedule and Cost.** It is anticipated that all models used for this project are approved by the ECO-PCX.

## 11. PUBLIC PARTICIPATION

The public has not been engaged to date as the project has just been initiated. The Cowlitz County Commissioners have been briefed on the initiation of the study and the PDT will develop a public participation plan for the project. Public participation will occur with the release of the draft report to the public for their review and comment. The final decision document and associated review reports will be made available to the public through the use of the District's website. Additional efforts will be included in the public participation plan.

## 12. REVIEW PLAN APPROVAL AND UPDATES

The Northwestern Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval are documented in Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the RMO and home MSC.

## 13. REVIEW PLAN POINTS OF CONTACT

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

- Amy Gibbons, Project Manager, Portland District, 503.808.4687

- Rebecca Weiss, Northwestern Division, 503.808.3728
- Tomma Barnes, Ecosystem Restoration Planning Center of Expertise, 910.251.4728

**ATTACHMENT 1: TEAM ROSTERS**

**Project Development Team**

| Name           | Organization | Role                              | Email  | Phone              |
|----------------|--------------|-----------------------------------|--|--------------------|
| Amy Gibbons    | CENWP-PM     | Project Manager/Plan Formulator   | <a href="mailto:amy.c.gibbons@usace.army.mil">amy.c.gibbons@usace.army.mil</a>         | 503.808.4687       |
| Sandra Jonkers | WDFW         | Project Manager                   | <a href="mailto:Sandra.jonkers@dfw.wa.gov">Sandra.jonkers@dfw.wa.gov</a>               | 360.696.6211 x6722 |
| Jerry Otto     | CENWP-EC     | Technical Lead/Civil Engineer     | <a href="mailto:Jerry.l.otto@usace.army.mil">Jerry.l.otto@usace.army.mil</a>           | 503.808.4983       |
| David Howe     | WDFW         | Habitat Manager                   | <a href="mailto:David.howe@dfw.wa.gov">David.howe@dfw.wa.gov</a>                       | 360.906.6729       |
| Pat Frazier    | WDFW         | Fisheries Manager                 | <a href="mailto:Patrick.Frazier@dfw.wa.gov">Patrick.Frazier@dfw.wa.gov</a>             | 360.696.6211 x6711 |
| Eric Kinne     | WDFW         | Engineering Manager               | <a href="mailto:Eric.kinne@dfw.wa.gov">Eric.kinne@dfw.wa.gov</a>                       | 360.906.6747       |
| Wolf Dammers   | WDFW         | Fisheries Biologist               | <a href="mailto:Wolfgang.Dammers@dfw.wa.gov">Wolfgang.Dammers@dfw.wa.gov</a>           | 360-696-6211 x6709 |
| Paul Sclafani  | CENWP-EC     | Hydrology and Hydraulics Engineer | <a href="mailto:Paul.sclafani@dfw.wa.gov">Paul.sclafani@dfw.wa.gov</a>                 | 503.808.4944       |
| Don Ponder     | WDFW         | Habitat Engineer                  | <a href="mailto:Donald.Ponder@dfw.wa.gov">Donald.Ponder@dfw.wa.gov</a>                 | 360.906.2547       |
| Phil Ohnstad   | CENWP-EC     | Cost Engineer                     | <a href="mailto:Phillip.c.ohnstad@usace.army.mil">Phillip.c.ohnstad@usace.army.mil</a> | 503.808.4424       |
| Chris Humphrey | CENWP-EC     | Geotechnical Engineer             | <a href="mailto:Chris.humphrey@usace.army.mil">Chris.humphrey@usace.army.mil</a>       | 503.808.4982       |
| Steve Helm     | CENWP-PM     | Environmental Planning            | <a href="mailto:Steve.r.helm@usace.army.mil">Steve.r.helm@usace.army.mil</a>           | 503.808.4778       |
| Donna Bighouse | WDFW         | Habitat Biologist                 | <a href="mailto:Donna.Bighouse@dfw.wa.gov">Donna.Bighouse@dfw.wa.gov</a>               | 360.906.6738       |
| TBD            | CENWP-PM     | Archaeologist                     | <a href="mailto:Amy.m.holmes@usace.army.mil">Amy.m.holmes@usace.army.mil</a>           | 503.808.4771       |
| TBD            | CENWP-RE     | Real Estate Specialist            |  |                    |

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

**COMPLETION OF AGENCY TECHNICAL REVIEW**

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

SIGNATURE \_\_\_\_\_ Date \_\_\_\_\_  
Name  
ATR Team Leader  
Office Symbol/Company

SIGNATURE \_\_\_\_\_ Date \_\_\_\_\_  
Name  
Project Manager  
Office Symbol

SIGNATURE \_\_\_\_\_ Date \_\_\_\_\_  
Name  
Architect Engineer Project Manager<sup>1</sup>  
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

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

**ATTACHMENT 3: REVIEW PLAN REVISIONS**

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

**ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS**

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