

# **REVIEW PLAN**

**Puyallup River Basin, Pierce County, Washington  
General Investigation**

**Seattle District**

**Last Revision Date: October 2010**



**US Army Corps  
of Engineers®**

**REVIEW PLAN**

**Puyallup River Basin, Pierce County, Washington.  
General Investigation**

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## 1. PURPOSE AND REQUIREMENTS

**a. Purpose.** This Review Plan (RP) defines the scope and level of review for the Puyallup River Basin, Pierce County, Washington – General Investigation Study (Feasibility Phase). The study is to be undertaken to determine and evaluate alternatives related to flood risk management within the Puyallup River Basin. This RP identifies the expertise of reviewers needed to conduct a thorough review of study products and the study product review schedule. Any questions regarding this plan may be directed to CJ Klocow, [CJ.Klocow@usace.army.mil](mailto:CJ.Klocow@usace.army.mil), 206-764-6073.

### b. References

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Dec 2009
- (2) Engineering Regulation (ER) 1105-2-100, Planning Guidance Notebook
- (3) EC 1105-2-407, Planning Models Improvement Program: Model Certification, 31 May 2005
- (4) ER 1110-2-12, Quality Management, 30 Sep 2006
- (5) Project Management Plan (PMP) for Feasibility Phase Study of Puyallup River Basin, Pierce County, Washington

**c. Requirements.** This RP was developed in accordance with EC 1165-2-209, which establishes the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision documents through independent review. The EC outlines three levels of review: District Quality Control (DQC), Agency Technical Review (ATR), and Independent External Peer Review (IEPR). In addition to these three levels of review, decision documents are subject to policy and legal compliance review and, if applicable, model certification/approval. These various elements shall be documented in a RP as part of the Project Management Plan (PMP).

## 2. STUDY INFORMATION

**a. Study/Project Authority.** Section 209, 1962 Flood Control Act (P.L. 87-874) and Study Resolution, Docket 2645, Committee on Transportation and Infrastructure, U.S. House of Representatives, 21 June 2000.

**b. Decision Document.** The integrated FR/EIS for Puyallup River Basin, Pierce County, Washington is being undertaken to determine and evaluate alternatives related to flood risk management within the Puyallup River Basin. The integrated FR/EIS will require approval from Major Subordinate Command (MSC), USACE Headquarters (HQUSACE), Chief of Engineers as well as Congressional authorization. The EIS will satisfy all requirements under the National Environmental Policy Act (NEPA).

**c. Study Description.** A majority of the Puyallup River watershed and its major tributaries (the Carbon and the White Rivers) are located in Pierce County, Washington, with the exception of a small portion north of the main stem White River located in King County. The Puyallup River Basin encompasses numerous towns and cities including Tacoma, the state's third largest city. The study is a single-purpose study intended to identify, evaluate, and implement measures to alleviate chronic flooding in the Puyallup/White River basin downstream of the Puget Sound Energy Inc. operated Electron Dam on the Puyallup River, the Carbon River, and downstream of the federally operated Mud Mountain Dam on the White River.

The reconnaissance study has identified significant flood risks in the lower Puyallup River basin including:

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- Chronic flooding to public and private properties
- Threat of flood damage to major transportation corridors
- Degradation of existing infrastructure
- Damage to agricultural properties
- Decreased channel capacity due to sedimentation

Major flooding occurs during the winter season from November through February, mainly as a result of the heavy rainfall and rain-on-snow events. Flooding can be localized within sub-basins or widespread throughout the entire basin. Recent flooding has adversely impacted multiple communities in the basin including Sumner, Fife, Puyallup and Tacoma.

In general, the extent of inundation and the associated flood damages in the study area can be related to insufficient conveyance capacity due to high sediment buildup, at-risk structures in the 100-year floodplain, insufficient protection of structures in the floodplain, obstructions to the flow including vegetation, and uncontrolled runoff from unregulated portions of the basin.

In response to flooding that occurred throughout the 1990s, Pierce and King Counties have identified flooding issues and have aggressively pursued measures to reduce the impacts of flooding, including pursuing the acquisition of lands within the 100-year floodplain and relocation of existing structures that have been subjected to repeat flooding. FEMA 100-year floodplain remapping may result in loss of existing FEMA levee certifications and may require that Pierce and King Counties further increase their flood management efforts.

Under the future without-project condition, the Puyallup River basin experiences continued flood damages, negatively impacting the local economy and threatening the lives of citizens nearby. The General Investigation offers an opportunity for the Corps, state and locals to evaluate flood risk management strategies to decrease the severity of flood damage. The study will address Safety Assurance factors such as life/safety issues, residual risk, and need for redundancies, as part of screening and design of alternatives.

The non-federal sponsor for this study is Pierce County.

- d. Factors Affecting the Scope and Level of Review.** The Project Delivery Team (PDT) made a risk informed decision that Agency Technical Review (ATR) is necessary for all major deliverables for this project. Furthermore, the team determined that Type I Independent External Peer Review (IEPR) as well as components of Type II IEPR (safety assurance review) will be required. These risk informed decisions regarding ATR and IEPR were guided by criteria presented in EC 1165-2-209, Section 15, Risk Informed Decisions on Appropriate Reviews. The project will require approval by the Assistant Secretary of the Army and authorization by Congress. Below are identified aspects of the project that will affect the scope and level of review:

#### General:

- The feasibility phase of the Puyallup River GI has significant interagency interest, may be controversial, has significant economic, environmental, and social effects, and requires an EIS.

#### Challenges and controversies:

- Environmental impacts are expected to result from various sediment control activities and levee enhancements. These activities will require environmental mitigation action to restore and maintain suitable conditions.

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- More than negligible adverse impacts are expected 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
- The project report is not likely to contain influential scientific information or be a highly influential scientific assessment.
- The project is likely to be highly controversial, there will likely be public dispute to the size, nature, economic costs, environmental costs and other factors associated with the project.
- The project report will not be based on novel methods, present complex challenges or interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practice.

Risk-related factors and significant effects:

- Under the without-project condition, the Puyallup River basin has experienced continued risk of flood damage to public and private property, transportation corridors, existing infrastructure, and agricultural properties.
- Any alternatives requiring operational or structural changes to Mud Mountain Dam will require ATR by Dam Safety and may require HQUSACE screening for safety design and residual risk.

Interagency involvement:

- This study is likely to have significant interagency interest.
  - The study process must recognize the special status of tribal nations and fully incorporate them into the planning process. Coordination with the Puyallup Tribes will be necessary due to land ownership and environmental issues. The Tribe owns a portion of the river up to the ordinary high watermark on both banks of the river in the study area.
  - Washington State Department of Transportation (WSDOT) has a strong vested interest in the development of this project due to the impact on various transportation infrastructures including SR 167. There is also a potential impact on bridges in the area that will need to be addressed and coordinated with WSDOT.
  - Washington Department of Natural Resources (WDNR) involvement may be necessary in the development of alternatives if dredging is given further consideration as a viable alternative.
  - United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) coordination (or formal consultation if needed) will occur during the feasibility phase to ensure compliance with the Endangered Species Act and USFW Coordination Act.
  - Burlington Northern Railroad owns and operates a railroad bridge that crosses the Puyallup River within the study area. The potential need to raise or alter the bridge will be addressed during the feasibility phase of the study.
- e. **In-Kind Contributions.** The local sponsor for this project is Pierce County. The sponsor is providing cash, public involvement and project management support for their cost share. Any products prepared by the non-federal sponsor or their contractors are subject to DQC, ATR, and IEPR.
- f. **Project Delivery Team (PDT).** The PDT is presented in Table 1. The project manager is the main point of contact at the Seattle District for more information about this project and the RP; CJ Klocow, [CJ.Klocow@usace.army.mil](mailto:CJ.Klocow@usace.army.mil), 206-764-6073.

**Table 1. Project Deliver Team Roster**

| <u>Discipline</u>                 | <u>Name</u>          | <u>Organization</u> |
|-----------------------------------|----------------------|---------------------|
| Project Manager                   | CJ Klocow            | USACE-PM            |
| Lead Planner                      | Linda Smith          | USACE-PM-PL-PF      |
| Assistant Planner                 | Keely Domville       | USACE-PM-PL-PF      |
| Economist                         | Kelly Baxter-Osborne | USACE-PM-PL         |
| Environmental Coordinator         | Jeffrey Laufle       | USACE-PM-PL-ER      |
| Cultural Resource Specialist      | Danielle Storey      | USACE-PM-PL-ER      |
| Civil Engineer                    | Lee Ford             | USACE-EC-DB-CS      |
| Hydraulic Engineer                | Douglas Knapp        | USACE-EC-HH-HE      |
| Real Estate                       | Kevin Kane           | USACE-RE-RS         |
| Public Affairs                    | Andrea Takash        | USACE-PAO           |
| Cost Engineering                  | Laura Orr            | USACE-EC-CO         |
| Geomorphology                     | TBD                  |                     |
| Program Analyst                   | Patricia Bauccio     | USACE-PM-CP-CM      |
| Budget Analyst                    | Cecile Viray         | USACE-PM-CP-CJ      |
| Office of Counsel                 | Virginia Ryan        | USACE-OC            |
| Structural                        | TBD                  |                     |
| Project Manager (Non-Fed Sponsor) | Harold Smelt         | Pierce County       |
| Sponsor Participant               | Randy Brake          | Pierce County       |
| Sponsor Participant               | Marsh Huebner        | Pierce County       |
| Sponsor Participant               | Lorin Reinelt        | Pierce County       |

### 3. DISTRICT QUALITY CONTROL

- a. **General.** DQC for decision documents covered by EC 1165-2-209 is managed by the home district in accordance with the MSC and district Quality Management Plans. All draft products and deliverables will be reviewed within the district as they are developed by the PDT to ensure they meet project and customer objectives, comply with regulatory and engineering guidance, and meet customer expectations of quality. Work products will be forwarded to the appropriate Branch Chiefs of disciplines directly involved with the development of the document. The Branch Chiefs will determine the most appropriate person to carry out the review of the document.
- b. **Products for Review.** All work products and reports, evaluations, and assessments shall undergo necessary and appropriate DQC, including National Environmental Policy Act (NEPA) documents, other environmental compliance products, and any in-kind services provided by the local sponsor. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices, and the recommendations before approval by the District Commander.
- c. **Documentation of DQC.** DrChecks<sup>sm</sup> review software will be used to document all DQC comments, responses, and associated resolutions accomplished throughout the review process. Relevant DQC records will be reviewed during each ATR event and the ATR team will provide comments as to the adequacy of the DQC effort for the associated product.

#### 4. AGENCY TECHNICAL REVIEW

- a. **General.** ATR for decision documents covered by EC 1165-2-209 is managed by the appropriate Planning Center of Expertise (PCX). The ATR shall ensure that 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 the results in a reasonably clear manner for the public and decision makers. Products will be reviewed against published guidance, including ER's, EC's, manuals, engineering technical letters, and bulletins.
- b. **Products for Review.** Products estimated for ATR include, but are not limited to: Feasibility Scoping Meeting (FSM) documentation; Alternative Formulation Briefing (AFB) documentation (including 10% design appendix); Draft and Final NEPA and other environmental compliance documentation, including appendices; draft and final FR/EIS (including 35% design appendix); and other interim key technical products such as necessary hydrology, surveys, investigations, economic, and environmental inventories. Interim ATR reviews for completed products (future without project condition reports for H&H, Environmental, and Economics) will be conducted as necessary to ensure that the study is moving forward on a sound base of data and assumptions. ATR may be conducted as necessary on any in-kind services provided by the local sponsor.
- c. **Required ATR Team Expertise.** The current ATR plan is to include at least 13 reviewers from outside the district (Table 2). This number is based on the following disciplines required to develop the draft and final FR/EIS. The ATR team leader will be from outside the home MSC. ATR reviewers shall be selected by the RMO (Division or PCX), as appropriate. ATR team candidates may be nominated by the home district.

The Puyallup River Basin encompasses a variety of land uses ranging from national forest lands, agriculture, light industry, electricity generation and moderately developed urban areas. The study will involve complex analysis of flood patterns, environmental impacts, and economic analysis and will require a team of experts in the following disciplines with expertise in flood risk management in the Pacific Northwest. It is recommended that reviewers should have a minimum of 5 years of experience working in the field of flood risk management in their respective discipline, and be a GS 12 or GS 13.

- Plan Formulation: Experience with Flood Risk Management studies, General Investigation requirements (feasibility), feasibility reports, experience with Planning ERs and ECs.
- Environmental/NEPA: Knowledge of Northwest biology, specifically knowledge of salmonid species (spawning, rearing, freshwater migration), wetlands, riparian habitats, knowledge of riverine systems. Familiarity with HEP.
- Cultural Resources: Knowledge of Northwest tribal cultures and archaeology
- Hydrology & Hydraulics (H&H): Knowledge of HEC models, BOR modeling, northwest hydraulics and hydrology, familiarity with rivers with water control structures, sediment transport and dredging projects.
- Geotechnical: Knowledge of levee fragility curve analysis, drilling requirements, design and construction of levees.
- Civil: Familiarity with levee design, construction, flood proofing, relocations.
- Structural: Familiarity with dam structures for flood risk management, knowledge of design and construction of bridges, specifically railroad systems.
- Geomorphology: Strong knowledge of riverine sediment transport. Familiarity with

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- Economics: Knowledge of flood risk management based damages, ecosystem benefit analysis, ICE/CA, FDA models.
- Cost Estimating: MCASES experience. Experience costing levee construction, dredging.
- Real Estate: Experience developing real estate requirements for levee construction, relocations.

Other disciplines may be involved in the project including, Hazardous / Toxic Waste.

**Table 2. Agency Technical Review Team Roster**

| <u>Discipline</u>         | <u>Name</u> | <u>Office/Agency</u> | <u>Years Experience</u> |
|---------------------------|-------------|----------------------|-------------------------|
| Review Team Lead          | TBD         |                      |                         |
| Planning                  | TBD         |                      |                         |
| Environmental Coordinator | TBD         |                      |                         |
| Cultural Resources        | TBD         |                      |                         |
| Civil/Soils Engineer      | TBD         |                      |                         |
| Structural Engineer       | TBD         |                      |                         |
| Hydraulic Engineer        | TBD         |                      |                         |
| Geomorphology             | TBD         |                      |                         |
| Environmental             | TBD         |                      |                         |
| Geotechnical Engineer     | TBD         |                      |                         |
| Cost Engineering          | TBD         |                      |                         |
| Real Estate Specialist    | TBD         |                      |                         |
| Economist                 | TBD         |                      |                         |

- d. Documentation of ATR.** DrChecks<sup>sm</sup> 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 ATR team leader will prepare a Review Report which includes a summary of each unresolved issue; each unresolved issue will be raised to the vertical team for resolution.

ATR may be certified when all ATR concerns are either resolved or referred to USACE Headquarters (HQUSACE) for resolution and the ATR documentation is complete. Certification of ATR should be completed, based on work reviewed to date, for the FSM, AFB (including 10% design appendix), draft report, and final report (including 35% design appendix).

**5. INDEPENDENT EXTERNAL PEER REVIEW**

- a. General.** Type I IEPR is conducted for decision documents if there is a vertical team decision (involving the district, MSC, PCX, and HQUSACE members) that the covered subject matter meets certain criteria (described in EC 1165-2-209) where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside the USACE is warranted. Type I IEPR is conducted by nationally recognized technical experts outside of the Corps of Engineers. Type I IEPR is coordinated by the appropriate PCX and managed by an Outside Eligible Organization (OEO) external to the USACE. 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. Type I IEPR will be conducted on the draft FR/EIS. The contract for a

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Type I IEPR is 100% federal cost and limited to \$500,000. Additional costs associated with Type I IEPR are cost shared.

Type II IEPR, also known as Safety Assurance Review, is typically conducted on implementation documents related to design and construction activities, especially those where potential hazards that pose significant threat to human life exist. The cost for Type II IEPR will be cost shared in accordance with the project purpose and phase. Type II IEPR will be completed in the Pre-Construction Engineering and Design (PED) phase and the construction phase. A subsequent review plan will outline products for review during the PED phase.

- b. Decision on IEPR.** The feasibility phase of the Puyallup River GI warrants a Type I IEPR, as the project has significant interagency interest, may be controversial, has significant economic, environmental, and social effects, requires an EIS, and the project cost will exceed \$45 million dollars. Estimated total project cost is \$ 72 million.

Type II IEPR will be required during the Preconstruction, Engineering, and Design (PED) phase due to the life safety risks associated with Flood Risk Management. A subsequent Review Plan that outlines requirements for Type II IEPR will be developed during the end of the feasibility phase.

The primary focus of the Type I IEPR will be to assess the adequacy and acceptability of the recommended project, including but not exclusive to the following:

- Economic and environmental assumptions and projections
- Project evaluation data
- Economic analyses
- Environmental analyses
- Formulation of alternative plans
- Methods for integrating risk and uncertainty
- Models used in the evaluation of hydraulic conditions, channel geomorphology, and flooding
- Models used in the evaluation of economic or environmental impacts of the proposed project
- Biological opinions of the project study
- Appropriateness of real estate required for action.
- Safety assurance issues (as defined in Appendix D of EC 1165-2-209)

Type I IEPR will also be used to assess the adequacy and acceptability of the entire draft decision document (including NEPA documentation and supporting technical appendices). The District will conduct Issue Resolution Conferences with the Vertical Team to review and resolve complex/controversial issues associated with key interim products prior to completion of the draft decision document.

The District will specifically charge the Type I IEPR panel to conduct a Safety Assurance Review for the 35% design of the selected alternative per EC 1165-2-209, Appendix D, paragraph 2.c.(3). Since the design and construction activities will require a Safety Assurance Review as defined in EC 1165-2-209 Appendix E, the Type I IEPR panel will address the following questions for the selected alternative:

- (a) In accordance with ER 1110-2-1150, is the quality and quantity of the surveys, investigations, and engineering sufficient for a concept design?
- (b) Are the models used to assess hazards appropriate?
- (c) Are the assumptions made for the hazards appropriate?

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(d) Does the analysis adequately address the uncertainty given the consequences associated with the potential for loss of life for this type of project?

- c. Products for Review.** The draft FR/EIS (including environmental documentation and technical appendices) will undergo Type I IEPR during the public review and prior to final approval. Type I IEPR will use appropriate analytical methods for each technical area. Additional review of key interim products will be determined as the study progresses. Type I IEPR may be conducted as necessary on any in-kind services provided by the local sponsor. The Type I IEPR panel will also conduct a Safety Assurance Review on the 35% design of the selected alternative resulting from the draft FR/EIS.
- d. Required Type I IEPR Team Expertise.** Type I IEPR reviewers will be selected by the RMO, contractor, or Outside Eligible Organization, as appropriate. The Type I IEPR panel candidates may be nominated by the District. The Puyallup River Basin encompasses a variety of land uses ranging from national forest lands, agriculture, light industry, electricity generation and moderately developed urban areas. The study will involve complex analysis of flood patterns, environmental impacts, and economic analysis and will require a team of experts with expertise in flood risk management in the Pacific Northwest in the following disciplines listed below. (Table 3) Additional technical areas requiring Type I IEPR may be identified during the study/review process.

**Required IEPR Panel Expertise.**

- Environmental/NEPA: Knowledge of Northwest biology, specifically knowledge of salmonid species (spawning, rearing, freshwater migration), wetlands, riparian habitats, knowledge of riverine systems. Familiarity with HEP.
- Civil: Familiarity with levee design, construction, flood proofing, relocations.
- Structural: Familiarity with dam structures for flood risk management, knowledge of design and construction of bridges, specifically railroad systems.
- Hydrology & Hydraulics (H&H): Knowledge of HEC models, BOR modeling, northwest hydraulics and hydrology, familiarity with rivers with water control structures, sediment transport and dredging projects.
- Economics: Knowledge of flood risk management based damages, ecosystem benefit analysis, ICE/CA, FDA models.
- Geomorphology: Strong knowledge of riverine sediment transport. Familiarity with
- Real Estate: Experience developing real estate requirements for levee construction, relocations.

**Table 3. Independent External Peer Review Panel Members**

| <u>Discipline</u>      | <u>Name</u> | <u>Office/Agency</u> | <u>Years Experience</u> |
|------------------------|-------------|----------------------|-------------------------|
| Environmental          | TBD         |                      |                         |
| Civil Engineering      | TBD         |                      |                         |
| Structural Engineering | TBD         |                      |                         |
| H&H Engineering        | TBD         |                      |                         |
| Economics              | TBD         |                      |                         |
| Geomorphology          | TBD         |                      |                         |
| Real Estate            | TBD         |                      |                         |

- e. Documentation of Type I IEPR.** The District may request that DrChecks<sup>sm</sup> review software will be used to document all Type I IEPR and Safety Assurance Review comments, responses and associated resolutions accomplished throughout the review process. Regardless of the documentation method,

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comments should be limited to those that are required to ensure adequacy of the product. The Type I IEPR panel will submit a final review report containing the panel’s economic, engineering, environmental analysis, and Safety Assurance Review of the project. The report will include the panel’s assessment of the adequacy and acceptability of the methods, models, and analyses used by the Corps. The final review report will be submitted by the Type I IEPR panel no later than 60 days following the close of the public comment period for the AFB submittal package. The District/PCX will disseminate the final Type I IEPR Review Report, USACE response, and all other materials related to the Type I IEPR on the district (and Northwest Division) website and include them in applicable decision documents.

**6. MODEL CERTIFICATION AND APPROVAL**

- a. General.** The use of certified or approved models for all planning activities is required by EC 1105-2-407. This policy is applicable to all planning models currently in use, models under development and new models. The appropriate PCX will be responsible for model certification/approval. Both the planning models (including the certification/approval status of each model) and engineering models used in the development of the decision document are described below:
- b. 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 |
|--|---|---------------------------------|
| <u>HEC-FDA 1.2.4 (Flood Damage Analysis)</u> | <u>The Hydrologic Engineering Center’s Flood Damage Reduction Analysis (HEC-FDA) program provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating flood risk management plans using risk-based analysis methods. The program will be used to evaluate and compare the future without- and with-project plans along the Wild River near River City to aid in the selection of a recommended plan to manage flood risk.</u> | <u>Certified</u>                |

- c. 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  |
|--|---|
| <u>HEC-RAS 4.0 (River Analysis System)</u> | 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. |

| Model Name and Version | Brief Description of the Model and How It Will Be Applied in the Study  |
|------------------------|---|
| <u>HEC-DSS</u>         | The Hydrologic Engineering Center’s Data Storage System is a database system designed to efficiently store and retrieve scientific data that is typically sequential. Such data types include, but are not limited to, time series data, curve data, spatial-oriented gridded data, and others. The |

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|  |   |
|--|---|
|  | system was designed to make it easy for users and application programs to retrieve and store data. HEC-DSS is incorporated into most of HEC's major application programs. |
|--|---|

| <b>Model Name and Version</b> | <b>Brief Description of the Model and How It Will Be Applied in the Study</b>  |
|-------------------------------|--|
| <u>HEC-FFA</u>                | The Hydrologic Engineering Center's Flood Frequency Analysis performs frequency computations of annual maximum flood peaks in accordance with the Water Resources Council "Guidelines for Determining Flood Flow Frequency," Bulletin 17B. |

| <b>Model Name and Version</b> | <b>Brief Description of the Model and How It Will Be Applied in the Study</b>   |
|-------------------------------|---|
| <u>HEC-FDA</u>                | The Hydrologic Engineering Center's Flood Damage Analysis (FDA) provides the capability to perform an integrated hydrologic engineering and economic analysis during the formulation and evaluation of flood risk management plans. |

| <b>Model Name and Version</b> | <b>Brief Description of the Model and How It Will Be Applied in the Study</b>  |
|-------------------------------|--|
| <u>HEC-geoRAS</u>             | The Hydrologic Engineering Center's tool for ArcGIS is used to communicate between HEC-RAS and ArcGIS. Geographic data can be sent from ArcGIS to HEC-RAS, and HEC-RAS results can be sent back to ArcGIS. |

| <b>Model Name and Version</b> | <b>Brief Description of the Model and How It Will Be Applied in the Study</b>   |
|-------------------------------|---|
| <u>ArcGIS 9.2</u>             | ArcGIS, developed by ESRI, is a geographic management tool that can be used to develop hydraulic models, indicate inundation areas, and store project data. |

| <b>Model Name and Version</b>                                    | <b>Brief Description of the Model and How It Will Be Applied in the Study</b>   |
|--|---|
| <u>Micro-Computer Aided Cost Estimating System (MCACES, MII)</u> | The second generation of the Micro-Computer Aided Cost Estimating System (MCACES). It is a detail cost estimating program that was developed in conjunction with Project Time & Cost, Inc. (PT&C). MII provides an integrated cost estimating system (software and databases) USACE requirements for preparing cost estimates for project alternatives. |

| <b>Model Name and Version</b>  | <b>Brief Description of the Model and How It Will Be Applied in the Study</b>   |
|--|---|
| <u>CHL SMS with ADH (Surface Water Modeling System with Adaptive Hydraulics)</u> | The USACE Coastal Hydraulic Laboratory's Surface Water Modeling System (SMS) is a comprehensive environment for one-, two-, and three-dimensional hydrodynamic modeling. Adaptive Hydraulics (ADH) is a state-of-the-art modeling system capable of handling sediment transportation. |
| <b>Model Name and Version</b>  | <b>Brief Description of the Model and How It Will Be Applied in the Study</b>   |
| <u>Bentley Microstation V8 XM</u>  | MicroStation V8 XM is used by engineers, architects, GIS professionals, constructors, and owner operators to design, model, visualize, document, map, and sustain infrastructure projects. This will be used to create 10% CAD designs of possible courses of action.                 |

|                           |  |
|---------------------------|--|
| <u>Bentley Inroads XM</u> | Bentley Inroads offers an innovative approach to designing civil components in the context of the whole project. Used to model proposed topography and site grading. |
|---------------------------|--|

d. Software requirements:

*ArcGIS*. This application facilitates storage and processing of geo-spatial data related to the study. GIS is commonly used by the Corps.

**7. POLICY AND LEGAL COMPLIANCE REVIEW**

a. **General.** All **decision documents** will be reviewed throughout the study process for their compliance with law and policy by the District Office of Counsel as addressed in Appendix C, EC 1165-209. 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 Chief of Engineers. 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. REVIEW SCHEDULES AND COSTS**

a. **ATR Schedule and Cost.** The ATR schedule and cost estimate is presented in Table 4.

**Table 4. ATR Schedule**

| <u>Task</u>          | <u>Date</u>  | <u>Estimated Cost</u> |
|----------------------|--------------|-----------------------|
| ATR of FSM Documents | April 2012   | \$50,000              |
| ATR of AFB Documents | March 2013   | \$50,000              |
| ATR of draft FR/EIS  | January 2014 | \$50,000              |
| ATR of final FR/EIS  | March 2015   | \$50,000              |
|                      |              |                       |
| Total:               |              | \$200,000             |

b. **Type I IEPR Schedule and Cost.** The IEPR schedule and cost estimate is presented in Table 5.

**Table 5. Type I IEPR Schedule**

| <u>Task</u>   | <u>Date</u> | <u>Estimated Cost</u> |
|---|-------------|-----------------------|
| PCX Coordination of Type I IEPR   | June 2013   | \$15,000              |
| Type I IEPR of Draft FR/EIS including Safety Assurance Review of 35% Design | July 2014   | \$585,000**           |
|   |             |                       |
| Total:  |             | \$600,000             |

\*Estimated contract for (6) reviewers

\*\* 500K for Type I IEPR contract, 85K coordination of comment resolution

REVIEW PLAN  
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- c. Model Certification/Approval Schedule and Cost.** No model certification is anticipated at this time. If model certification is needed, this review plan will be updated and all necessary review and certification efforts will be coordinated.

## 9. PUBLIC PARTICIPATION

The public will be invited to comment directly to the PDT through informal and formal public scoping meetings and public review comment periods programmed into the feasibility schedule. This includes but will not be limited to documents developed for the FSM, AFB, and NEPA documentation. The Draft and Final FR/EIS will be made available for public comment either when the document is submitted to or is being reviewed by the Type I IEPR team. A public meeting may be scheduled. Additionally, the public will be provided with the opportunity to nominate reviewers. Public input will be available to the ATR and Type I IEPR teams to ensure public comments have been considered in development of the draft and final FR/EIS.

This RP and the accompanying PMP will be posted to the District web site for public review once it is approved by the MSC. Final ATR and Type I IEPR documents will be posted on District website for public review.

## 10. PCX COORDINATION

Review plans for decision documents and supporting analyses outlined in EC 1165-2-209 are coordinated with the appropriate PCX based on the primary purpose of the basic decision document to be reviewed.

This project is a single purpose flood risk management study. The lead PCX for this study is the Flood Risk Management-PCX: <http://www.spd.usace.army.mil/frm-pcx>

The lead PCX will coordinate with the Cost Engineering Directory of Expertise (DX) to conduct ATR of cost estimates.

## 11. MSC APPROVAL

Northwestern Division is the MSC that oversees the Seattle District, and is responsible for approving the RP. A MSC approval letter is required for each review plan and must be signed by the MSC Commander. The commander's approval should reflect vertical team input (involving district, MSC, PCX, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the RP is a living document and may change as the study progresses. Changes to the RP should be approved by following the process used for initially approving the plan. In all cases the MSC will review the decision on the level of review and any changes made in updates to the project.

## 12. REVIEW PLAN POINTS OF CONTACT

Questions and/or comments on this RP can be directed to the following points of contact:

- CJ Klocow, Project Manager, Puyallup River Basin, WA Feasibility Study, 206-764-6073.
- Valerie Ringold, Northwest Division, 503-808-3984
- Gene A. Sturm, Program Manager, Flood Risk Management-PCX, 402-995-2691, [gene.a.sturm@usace.army.mil](mailto:gene.a.sturm@usace.army.mil)

## **ATTACHMENT 1: GLOSSARY**

### **Agency Technical Review (ATR):**

ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of the project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR team reviews the various work products and assure that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists, etc.), and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home Major Subordinate Command (MSC).

### **District Quality Control (DQC):**

DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the PMP. It is managed in the home district and may be conducted by staff in the home district as long as they are not doing the work involved in the study, including contracted work that is being reviewed. Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices and the recommendations before approval by the District Commander.

### **Independent External Peer Review (IEPR):**

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. Any work product, report, evaluation, or assessment that undergoes DQC and ATR may also be required to undergo IEPR. IEPR is coordinated by the appropriate Planning Center of Expertise (PCX) and managed by an Outside Eligible Organization (OEO) external to the USACE. The OEO will select panel members using the National Academies of Science (NAS) policy for selecting reviewers. The scope of review will be scalable to the work product being reviewed and will address all underlying planning and engineering, including safety assurance, economics, and environmental analyses performed, not just one aspect of the project. Type I IEPR is generally for decision documents whereas Type II IEPR is generally for implementation documents.

- (i) Type I IEPR is mandatory if any of the following are true: 1) Significant threat to human life; 2) Total estimated project cost is > \$45M; 3) A request is made for independent peer review by a State Governor of an affected state; 4) Chief of Engineers determines that the project study is controversial due to significant public dispute over either the size, nature, or effects of the project or the economic or environmental costs or benefits of the project. If a decision document does not automatically trigger a Type I IEPR, a risk-informed recommendation will be developed. Type I IEPR is discretionary where a request is made by the head of a Federal or state agency charged with reviewing the project study if he/she determines that the project is likely to have significant adverse impacts.
- (ii) Type II IEPR – Safety Assurance Review (SAR). All design and construction activities addressing hurricane and storm risk management; flood risk management; and other projects where existing and potential hazards pose a significant threat to human life are required to undergo SAR. External panels will review the design and construction activities prior to initiation of physical construction and periodically thereafter until construction activities are completed on a regular schedule sufficient to inform the Chief of Engineers on the adequacy,

appropriateness, and acceptability of the design and construction activities for the purpose of assuring public health, safety, and welfare.

**Model Certification/Approval:**

EC 1105-2-407 requires certification (for Corps models) or approval (for non-Corps models) of planning models used for all planning activities. The EC defines planning models 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.

**Outside Eligible Organization:**

An organization that:

- (1) is described in section 501(c)(3), and exempt from Federal tax under section 501(a), of the Internal Revenue Code of 1986;
- (2) is independent;
- (3) is free from conflicts of interest;
- (4) does not carry out or advocate for or against Federal water resources projects; and
- (5) has experience in establishing and administering peer review panels.

**Peer Review:**

Peer Review is the process of subjecting research, assumptions, analyses, and conclusions to the scrutiny of others who are experts in the same field. Peer review requires a community of experts in a given (and often narrowly defined) field, who are qualified and able to perform impartial review.

**Policy and Legal Compliance Review:**

Decision documents will be reviewed throughout the study process for their compliance with law and policy. 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. Guidance for policy and legal compliance reviews is addressed further in Appendix H, ER 1105-2-100, Planning Guidance Notebook. DQC and ATR will address compliance with pertinent USACE policies. IEPR teams are not expected to be knowledgeable of Army and administration policies, nor are they expected to address such concerns. The home district Office of Counsel is responsible for the legal review of each decision document and signing a certification of legal sufficiency.

**ATTACHMENT 3: REVIEW PLAN REVISIONS**

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