



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, U.S. ARMY CORPS OF ENGINEERS
FORT SHAFTER, HAWAII 96858-5440

CEPOD-PDC

6 Dec 12

MEMORANDUM FOR COMMANDER HONOLULU ENGINEER DISTRICT (CEPOH-PP-C/CINDY BARGER), BUILDING 230, FORT SHAFTER, HI 96858-5440

SUBJECT: Review Plan Approval for the Kuliouou Stream Continuing Authorities Program Section 205 Flood Risk Management Project Feasibility Report, Island of Oahu, Hawaii

1. References:

a. Engineering Circular 1165-2-209, Civil Works Review Policy, 31 January 2010, and Change 1, 31 January 2012.

b. Policy Memorandum #1, HQ USACE, CECW-P, 19 January 2011, subject: Continuing Authority Program Planning Process Improvements.


c. Review Plan for the Kuliouou Stream Section 205 Feasibility Report, Island of Oahu, Hawaii, Honolulu District, U.S. Army Corps of Engineers.

2. The enclosed Review Plan (reference 1.c.) for the Kuliouou Stream, Island of Oahu, Hawaii, flood risk management feasibility report was prepared IAW references 1.a. and 1.b. The Pacific Ocean Division Civil Works Division is the lead office to execute this Review Plan. This plan does include Type I Independent External Peer Review.

3. I approve this Review Plan. It is subject to change as circumstances require, consistent with project development under the Project Management Business Process. Subsequent revisions to this Review Plan or its execution will require new written approval from this office.

4. The point of contact for this memorandum is Mr. Russell Iwamura, Senior Economist, Civil Works Integration Division, at 808-835-4625 or email Russell.K.Iwamura@usace.army.mil.

Encl


GREGORY J. GUNTER
Colonel, EN
Acting Commander

REVIEW PLAN

KULI‘OU‘OU STREAM FLOOD RISK MANAGEMENT STUDY
ISLAND OF O‘AHU, HAWAI‘I

Feasibility Study
Continuing Authorities Program
Section 205 of the Flood Control Act of 1948
Public Law (PL) 80-858

U.S. Army Corps of Engineers, Honolulu District



Kuli‘ou‘ou Stream

MSC Approval Date: 6 December 2012
Last Revision Date: 19 November 2012



US Army Corps
of Engineers ®

This page is left intentionally blank.

REVIEW PLAN

KULI‘OU‘OU STREAM FLOOD RISK MANAGEMENT STUDY
ISLAND OF O‘AHU, HAWAI‘I

Feasibility Study
Continuing Authorities Program
Section 205 of the Flood Control Act of 1948
Public Law (PL) 80-858

TABLE OF CONTENTS

1. PURPOSE AND REQUIREMENTS	2
3. STUDY INFORMATION	2
4. DISTRICT QUALITY CONTROL (DQC).....	6
5. AGENCY TECHNICAL REVIEW (ATR).....	7
6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR).....	10
7. POLICY AND LEGAL COMPLIANCE REVIEW	13
8. COST ENGINEERING MANDATORY CENTER OF EXPERTISE (MCX) REVIEW AND CERTIFICATION	13
9. MODEL CERTIFICATION AND APPROVAL	13
10. REVIEW SCHEDULES AND COSTS	15
11. PUBLIC PARTICIPATION	16
12. REVIEW PLAN APPROVAL AND UPDATES	16
13. REVIEW PLAN POINTS OF CONTACT	16
ATTACHMENT 1: TEAM ROSTERS	18
ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS.....	20
ATTACHMENT 3: REVIEW PLAN REVISIONS	22
ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS.....	23

This page is left intentionally blank.

1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level of peer review for the Kuli‘ou‘ou Flood Risk Management (FRM) Study, Island of O‘ahu, Hawai‘i, Feasibility Study, Continuing Authorities Program (CAP), Section 205 of the Flood Control Act of 1948, Public Law (PL) 80-858.

This Review Plan was developed using the National Planning Center of Expertise (PCX) review plan template, dated 15 June 2011.

b. References.

(1) Engineer Circular (EC) 1165-2-209, Civil Works Review Policy, 31 January 2010 and Change 1, 31 January 2012.

(2) EC 1105-2-412, Assuring Quality of Planning Models, 31 March 2011.

(3) Engineer Regulation (ER) 1110-1-12, Quality Management, 30 September 2006.

(4) ER 1105-2-100, Planning Guidance Notebook, Appendix F, Continuing Authorities Program, Amendment #2, 31 January 2007.

(5) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 November 2007.

(6) Kuli‘ou‘ou FRM Feasibility Study Project Management Plan (PMP), dated June 2008.

(7) Director of Civil Works Policy Memorandum #1, “CAP Planning Process Improvements,” dated 19 January 2011.

(8) U.S. Army Corps of Engineers (USACE) Pacific Ocean Division (POD) Quality Management Plan, December 2010.

(9) USACE Honolulu District (POH) Civil Works Review Policy (ISO CEPOH-C_12203), 1 November 2010.

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; 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, CAP decision documents are subject to cost engineering review and certification (per EC 1165-2-209), Director of Civil Works’ Policy Memorandum #1, and Value Management Plan requirements in the Project Management Business Process (PMBP) Reference 8023G and the ER 11-1-321, Change 1.

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 a PCX or the Risk Management Center (RMC), depending on the primary purpose of the decision document. In accordance with EC 1165-2-209, as a CAP project, the RMO for the peer review effort described in this Review Plan is POD. As needed, POD will seek assistance or direct POH to coordinate with the National FRM-PCX.

POD will coordinate with the Cost Engineering Mandatory Center of Expertise (MCX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies. As a FRM study, there are potential life safety issues associated with flooding and reducing risk of flooding to the residents of Kuli‘ou‘ou watershed. POD will coordinate with the RMC, as appropriate, for review of these life safety issues.

3. STUDY INFORMATION

a. Study Authority. Investigation of Kuli‘ou‘ou Stream FRM, O‘ahu, Hawai‘i, is being conducted under authority of Section 205 of the Flood Control Act of 1948 (PL 80-858), as amended.

Section 205 of the Flood Control Act of 1948, as amended, is one of the legislative authorities within the CAP under which the Secretary of the Army, acting through the Chief of Engineers, is authorized to plan, design, and implement certain types of water resources projects without additional project specific congressional authorization. CAP projects are water resource related projects of smaller scope, cost, and complexity than typical USACE civil works projects which require specific authorization by Congress. Under the delegated authority of Section 205, USACE is authorized to plan, design, and construct FRM projects without project specific congressional authorization.

b. Decision Document. An integrated feasibility study and environmental assessment (EA) are being prepared for this project. The purpose of the document is to identify a recommended plan to reduce flood risk to the residents in the Kuli‘ou‘ou watershed from Kuli‘ou‘ou stream. As a CAP project, the POD Commander will be approving the decision document.

c. Study/Project Description.

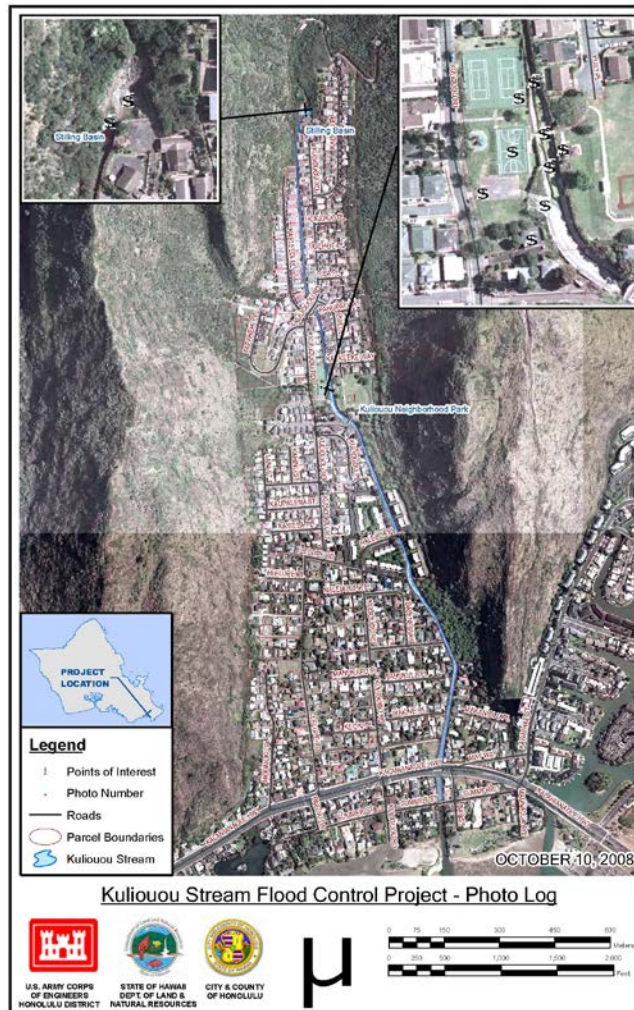
Project Sponsors. The project sponsors are the State of Hawai‘i, Department of Land and Natural Resources and the City and County of Honolulu.

Project Objective: The project objective is to provide FRM in the Kuli‘ou‘ou Stream. The study objectives include:

- Reduce floods risk and related damages.
- Reduce amount of debris within the channel.
- Reduce flow energy and velocities in areas susceptible to damage.
- Reduce the amount of direct runoff causing nuisance flooding.
- Maintain natural areas in the upper watershed.

Study Location: The project is located on the island of O‘ahu, Hawai‘i. Kuli‘ou‘ou Stream is located about 9 miles southeast of Honolulu. Kuli‘ou‘ou Stream and the drainage basin are comprised of approximately 1,030 acres and are 0.8 miles wide and 2.7 miles long extending to sea level flowing into Maunalua Bay. The lower portion of the stream is flat while the upper reaches of the basin rise abruptly to 2,390 feet above sea level (Figure 1).

Figure 1: Kuli'ou'ou Stream Location Map



Problems and Opportunities: The project was originally authorized and constructed under Section 205. However, the existing conditions are substantially different from the time the original project was implemented. The capacity of the flood control improvements may be inadequate due to the increased residential development upstream of the project.

The Kuli'ou'ou Stream drainage system experiences three basic problems:

- The inability of the existing concrete flood control channel to accommodate debris flows or debris floods.
- Undersized debris basin to accommodate debris flows.

- The lack of design continuity of the original flood control channel and subsequent upstream channel improvements.

Background: Kuli‘ou‘ou Stream has been altered, channelized, and reinforced with concrete. The alteration to the lower portion was constructed by USACE in February 1970, authorized under Section 205 of the Flood Control Act of 1948. The USACE project consists of a 300-foot long channel dredged into Maunaloa Bay; a 7-foot wide, reinforced concrete ditch to convey interior drainage through a box culvert under Kalaniana‘ole Highway; a 1,300-foot long reach of reinforced concrete invert with reinforced concrete walls; and partial reinforced concrete lining of a 3,100-foot long reach overlaying existing trapezoidal grouted riprap and rectangular concrete-rubble masonry sections.

The section of stream above the Kuli‘ou‘ou Neighborhood Park was constructed and altered by a private company in the 1980s. This project consists of approximately 2,500 feet of rectangular reinforced concrete channel transitioning into station 46+98 of the federal project at the park, and a debris basin and boulder trap located at the top of Kuli‘ou‘ou Road.

New Year’s Eve Flood of 1987: The USACE funded project was extensively damaged as a result of flooding on December 31, 1987 and January 1, 1988. Under the authority of PL 84-99, USACE cleared debris and rehabilitated the damaged flood control channel in 1989 at a cost of \$1,491,000. Work included replacement of approximately 240 linear feet of concrete channel lining, replacement of the right wing wall of the debris basin and repair of potholes and concrete rubble masonry damages.

The original flood control channel was designed to begin in the area of Kuli‘ou‘ou Neighborhood Park. A severe double bend in the channel was constructed in the area of the park to avoid displacing homes in the area of the park. At the time of construction, the double bend had very little impact on the hydraulics of the stream. However, as further development occurred upstream, channel improvements were added which significantly increased the flow velocities impacting the first bend. The combination of an increased debris load in the channel and the mix of old and new channel, along with the distinct double bend delineating the two, ultimately created the failure point of the New Year’s Eve event.

The addition of boulders and debris carried by the floodwaters likely caused unanticipated impact forces to occur at the bend, although the double channel bend might have been able to convey fluvial flood capacities of the upper channel section. Thus, during the New Year’s Eve event the concrete lining of the channel bend failed. The channel downstream of the bend was damaged as the slopes became flatter in the downstream area. Channel material scoured out by the torrent settled out and began filling the channel. Because of the debris and boulders carried by the floodwaters the conveyance capacity in the channel was reduced, subsequently the floodwaters overflowed the banks and flooded the lower reaches of the valley.

Alternative Plans. The Project Delivery Team (PDT) is evaluating the following main alternatives:

- No Action.
- Larger Debris Basin.
- Series of Check Dams.
- Flood Proofing and Drainage Improvements.
- Stilling Basin at Kuli‘ou‘ou Park and Check Dams.

Estimated Construction Costs: Construction Costs are estimated at \$5 to \$7 million.

d. Factors Affecting the Scope and Level of Review. As a CAP project, the project risks are minimal. Environmental impacts are anticipated to be less than significant. Plan formulation is not expected to be challenging or novel. The project alternatives will be formulated to ensure that consideration is given to reducing flood risk to the entire watershed. The full opportunities and benefits associated with a FRM project must be considered. The project is not anticipated to require redundancy, resiliency and/or robustness, unique construction sequencing, or reduction in overlapping design construction schedules. There has been no request by the Governor for peer review by independent experts, nor is there significant public dispute over any aspect of the proposed project. The primary concern for this project is the potential life safety issues associated with FRM projects.

As a FRM project, there is the potential for life safety issues in the event that FRM measures fail during a flood event and place residents at risk. A Type I Independent External Peer Review (IEPR) will be needed. Consistent with EC 1165-2-209, Mr. Todd Barnes, POH Chief of Engineering and Construction, concurs with the assessment that there are potential life safety issues at this stage in plan formulation. If life safety issues are minimized as the tentatively selected plan is determined, POH will seek an exclusion from the IEPR requirement in accordance with USACE regulations and policies.

e. In-Kind Contributions. Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC and ATR, similar to any products developed by USACE. The anticipated in-kind services from the non-Federal sponsor are described in the PMP for this study. DQC and ATR of this information will be conducted with the DQC and ATR of the feasibility report/EA.

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 PMP. POH shall manage DQC process. Documentation of DQC activities is required and should be in accordance with the Quality Manuals of POH and POD.

a. Documentation of DQC. Consistent with the POH Quality Manual, DQC will be documented using the POH DQC review table. When all comments have been addressed and back checked, the DQC lead will sign a DQC certification in compliance with the POH Quality Manual. The DQC comments and responses will be provided for the ATR team at each review.

b. Products to Undergo DQC. The following products will be subject to DQC:

- (1) Draft and final integrated feasibility report/EA.
- (2) All technical reports and appendices developed in support of the integrated feasibility report/EA.
- (3) The draft and final EA decision.

c. Required DQC Expertise. The following expertise are needed for DQC:

- FRM plan formulation;
- Hydraulic engineering with expertise in tropical/flash flood systems;
- Environmental specialist with expertise in Civil Works environmental compliance including National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), Clean Water Act (CWA) Section 404(b)(1) alternatives analysis; and Executive Order (EO) 11988 Floodplain Management; and,
- Economist with expertise in FRM studies.

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of an 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. Additionally, the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by POD and is conducted by a qualified team from outside POH 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 POD, the home MSC.

a. Products to Undergo ATR. Because the project is not complex, the PDT assumes the ATR of the draft report will be adequate. However, based on DQC and ATR comments, POH and POD will evaluate the study to determine if additional ATRs are needed. The following products will undergo an ATR:

- (1) Draft integrated feasibility report/EA.
- (2) All technical reports and appendices developed in support of the integrated feasibility report/EA.
- (3) The draft EA decision.

b. Required ATR Team Expertise. The following ATR expertise is required for this project. Because the project is small, where possible, ATR team members will address multiple disciplines and emphasis. POD will identify the final make-up of the ATR team and the ATR team lead in coordination with the PM, vertical team and other appropriate centers of expertise. Once identified, the ATR team members for this study and a brief description of their credentials will be added in Attachment 1.

Table 1: ATR Required Expertise

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional preferably with experience in preparing flood damage reduction decision documents (i.e. Section 205 CAP studies) 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, hydrology and hydraulics, economics, environmental resources, etc). The ATR Lead must be from outside POD.
Planning	The planning reviewer should be a senior water resources planner with experience in flood risk management, CAP projects and compliance with EO 11988 Floodplain Management.
Economics	The economics reviewer should be a senior economist with experience in flood risk management and CAP projects
Environmental Resources	The Environmental reviewer should have experience in CAP projects, Civil Works environmental compliance, including NEPA, NHPA, CWA Section 404(b) (1) alternatives analysis; and EO 11988 Floodplain Management. Familiarity with the Habitat Equivalency Protocol (HEP) methodology for stream systems will also be required for review of the

ATR Team Members/Disciplines	Expertise Required
	study specific ecosystem output model.
Hydrology and Hydraulic Engineering	The Hydrology and Hydraulic Engineering reviewer will be an expert in the field of hydrology and hydraulics and have experience and understanding of tropical and/or flash flood systems with knowledge on proposed measures of open channel dynamics, levels, and enclosed channel systems.
Structural/Geotechnical Engineering	Structural/Geotechnical reviewer should have extensive experience in foundation analysis and structural design and evaluation of flood risk management structures (i.e. Concrete channels, floodwalls, levee embankments, etc).
Cost Engineering	The Cost Engineering reviewer will have experience in flood risk management and CAP projects.
Real Estate	The Real Estate reviewer will have experience in FRM and CAP projects.

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

(1) The review concern – identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;

(2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not been properly followed;

(3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and

(4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

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

The ATR documentation in DrCheckssm 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 POH, POD and possibly the FRM-PCX 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 DrCheckssm 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.

The 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 draft report and final report. A sample Statement of a 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 an IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in 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 an Outside Eligible Organization (OEO) external to USACE. 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 (SAR)) 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 SAR, is managed by the Risk Management Center (RMC) and is 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, acceptability of the design, and construction activities in assuring public health safety and welfare.

- a. Decision on IEPR.** As a FRM project, there is a potential for life safety issues related to FRM reduction measures such as levees, channel alterations, and considerations of work in flood plains. Consistent with the Director of Civil Works Policy Memorandum #1 dated 19 January 2011, Section 205 studies have the potential for life safety issues and require a Type I IEPR. As the tentatively selected plan is formulated, POH may determine that life safety issues are minimal. In this event, POH will coordinate with POD and the FRM PCX, and seek appropriate exclusion from the IEPR requirement.

The project is not anticipated to require an Environmental Impact Statement (EIS) and will not produce influential scientific information. There have been no requests for an IEPR from a head of a Federal or state agency charged with reviewing the project. There are no innovative materials or techniques proposed. The project design will not require redundancy, resiliency, and/or robustness. The project does not have unique construction sequencing or a reduced or overlapping design construction schedule.

Since the project is a FRM project, a Type II IEPR is anticipated on the design and construction of this project. Safety Assurance will also be addressed during the Type I IEPR per Paragraph 2.c. (3) of Appendix D of EC 1165-2-209.

- b. Products to Undergo Type I IEPR.** The draft integrated feasibility report/EA and draft EA decision and supporting technical documentation will undergo a Type I IEPR. The IEPR will be scheduled with the public review of the report.

- c. Required Type I IEPR Panel Expertise.** The following IEPR expertise is required for this project. Because the project is small, where possible, IEPR panel members will address multiple disciplines and emphasis. POD will identify the final make-up of the expertise required for the IEPR team in coordination with the PM, vertical team and other appropriate centers of

expertise. Once identified, the IEPR panel members for this study and a brief description of their credentials will be added in Attachment 1.

Table 2: IEPR Required Expertise

IEPR Panel Members/Disciplines	Expertise Required
Economics	The Economics Panel Member should be a senior economist with experience in flood risk management projects.
Environmental	The Environmental Panel Member should have experience in NEPA, NHPA, CWA Section 404(b) (1) alternatives analysis; and EO 11988 Floodplain Management. No federally listed endangered species occur in the study area.
Engineering	The Engineering Panel Member(s) should have extensive experience in hydraulic engineering in tropical and/or flash flood systems, design/construction of flood risk management structures (i.e. reinforced concrete channel, floodwalls, levee embankments, etc.) and foundation analysis.

d. Documentation of Type I IEPR. The IEPR panel will be selected and managed by an OEO per EC 1165-2-209, Appendix D. Panel comments will be compiled by the OEO and should address the adequacy and acceptability of the economic, engineering, environmental methods, models, and analyses used. IEPR comments should generally include the same four key parts as described for ATR comments in Section 5.c above. The OEO will prepare a final Review Report that will accompany the publication of the final decision document and shall:

- 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; 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.

The final Review Report will be submitted by the OEO, no later than 60 days following the close of the public comment period for the draft decision document. USACE shall consider all recommendations contained in the Review Report and prepare a written response for all recommendations adopted or not adopted. The final decision document will summarize the Review Report and USACE response. The Review Report and USACE response will be made available to the public, including through electronic means on the internet.

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 POD 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 MANDATORY CENTER OF EXPERTISE (MCX) REVIEW AND CERTIFICATION

For CAP projects, ATR of the costs may be conducted by pre-certified district cost personnel within the region or by the Walla Walla Cost MCX. The pre-certified list of cost personnel has been established and is maintained by the Cost MCX at: <https://kme.usace.army.mil/EC/cost/CostAtr/default.aspx>. The cost ATR member will coordinate with the Cost MCX for execution of cost ATR and cost certification. The Cost MCX will be responsible for final cost certification and may be delegated at the discretion of the Cost MCX.

9. MODEL CERTIFICATION AND APPROVAL

a. Planning Models. The approval of planning models under EC 1105-2-412 is not required for CAP projects. The POD Commander is responsible for assuring models for all planning activities are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models 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 selection and application of the model and the input and output data are still the responsibility of the users and are subject to DQC, ATR, and IEPR (if required).

For this project, the PDT plans to use USACE Hydrologic Engineering Center’s Flood Damage Analysis (HEC-FDA) model and the Institute for Water Resources (IWR) Planning Suite 2.0 to assist with the Cost Estimating/Incremental Cost Analysis (CE/ICA) and a study specific spreadsheet model for the ecosystem output model. HEC-FDA and the IWR Planning Suite models have been certified by USACE as an acceptable planning model. Detailed descriptions of these models are provided in Table 3.

Table 3: Planning Models and Certification/Approval Status

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
HEC-FDA 1.2.4	The 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 Kuli‘ou‘ou Stream to aid in the selection of a recommended plan to manage flood risk.	Certified
IWR Planning Suite	This model assists with formulating plans, cost-effectiveness, and incremental cost analysis, which are required for ecosystem restoration projects. An “annualizer” module has been included to allow for easy calculations of equivalent annual average values, total net values, and annualizing non-monetary benefits and calculating costs.	Certified
Kuli‘ou‘ou Study Site Specific Spreadsheet Mitigation Model	Depending on the Tentatively Selected Plan, an ecosystem output model may be required to assess the mitigation requirements for this study. In the absence of any regionalized ecosystem output model that quantifies habitat benefits for stream habitats in Hawai‘i, a customized spreadsheet model will be developed specifically for use on the Kuli‘ou‘ou Stream FRM Study. This is considered to be an appropriate approach, as a spreadsheet model can be tailored to focus on metrics that are directly applicable to the project mitigation objective. In particular, habitat quality parameters contained within the model can serve as a key dataset for quantification of habitat impacts and benefits in the spreadsheet model. In addition, elements of the HEP approach will be used, as State of Hawai‘i Division of Aquatic Resources has conducted a state wide stream and watershed assessment using this approach, providing focused baseline information on stream functions throughout the State, including Kuli‘ou‘ou Stream.	Model will be reviewed during ATR.

b. Engineering Models. 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 initiative, many engineering models have been identified as preferred or

acceptable for use on USACE studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data are still the responsibility of the users and are subject to DQC, ATR, and IEPR (if required).

The following engineering models are anticipated to be used in the development of the decision document:

Table 4: Engineering Model and Approval Status

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 Kuli‘ou‘ou stream and its tributaries.	HH&C CoP Preferred Model
Microcomputer Aided Cost Engineering System (MCACES) 2 nd Generation (MII)	The MCACES MII construction cost estimating software, developed by Building Systems Design, Inc., is a tool used by cost engineers to develop and prepare all USACE Civil Works cost estimates. Using the features in this system, cost estimates are prepared uniformly allowing cost engineering throughout USACE to function as one virtual cost engineering team.	Cost Engineering MCX Required Model

10. REVIEW SCHEDULES AND COSTS

a. ATR Schedule and Cost. The ATR for this study will be accomplished in accordance with the cost and schedule in the PMP. As of the approval date of this Review Plan, the ATR of the draft document is scheduled as follows:

- Draft report review: March 2014.
- Estimated cost: \$25,000.

b. Type I IEPR Schedule and Cost. The IEPR for this study will be accomplished in accordance with the cost and schedule in the PMP. As of the approval date of this Review Plan, the IEPR is scheduled as follows:

- Draft report review: June 2014.
- Estimated Contract Cost: \$75,000.

Pursuant to Section 2034 of Water Resource Development Act (WRDA) of 2007, this amount is 100% federally funded.

- Estimated Cost for POH and FRM-PCX Coordination of the IEPR: \$40,000.

This estimate was developed using the Type I IEPR Standard Operating Procedure table provided by the PCXs. This amount is cost-shared between USACE and the non-Federal Sponsor.

c. Model Certification/Approval Schedule and Cost. The Kuli‘ou‘ou Study Site Specific Spreadsheet Mitigation Model will be used on a one-time basis. This model will be reviewed during ATR in accordance with the reference 1.b.(7).

11. PUBLIC PARTICIPATION

A Public Involvement Plan will be developed for the feasibility study to guide the public participation process. Small group meetings have and will be conducted to collect specific information relevant to study goals and objectives and provide information to key stakeholders and interest groups relevant to the study goals and objectives. A public meeting will be held during the public review process to seek input on the draft report.

12. REVIEW PLAN APPROVAL AND UPDATES

The POD Commander is responsible for approving this Review Plan. The POD Commander’s approval reflects vertical team input (involving POH, POD, and possibly the FRM-PCX, 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 POH is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last POD 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 POD Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the POH Commander’s approval memorandum, should be posted on the POH webpage. The latest Review Plan should also be provided to POD, as the RMO.

13. REVIEW PLAN POINTS OF CONTACT

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

Honolulu District
Ms. Debbie Solis
Project Manager
Civil and Public Works Branch
Programs and Project Management Division

U.S. Army Corps of Engineers, Honolulu District
Building 230, Room 307
Ft. Shafter, HI 96858
Telephone: (808) 835-4035

Review Management Organization/Pacific Ocean Division
Mr. Russell Iwamura
U.S. Army Corps of Engineers, Pacific Ocean Division
Building 525
Ft. Shafter, HI 96858-5440
Telephone: (808) 835-4625

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

COMPLETION OF AGENCY TECHNICAL REVIEW

The ATR has been completed for the *<type of product>* for the Kuli‘ou‘ou Stream Flood Risk Management Project, Island of O‘ahu, Hawai‘i. 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 USACE policy. The ATR also assessed the 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 DrCheckssm.

SIGNATURE

Name

ATR Team Leader

Office Symbol/Company

Date

SIGNATURE

Name

Project Manager

Office Symbol

Date

SIGNATURE

Name

Architect Engineer Project Manager¹

Company, location

Date

SIGNATURE

Name

Review Management Office Representative

Office Symbol

Date

CERTIFICATION OF AGENCY TECHNICAL REVIEW

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

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

SIGNATURE

Name

Chief, Engineering Division

Office Symbol

Date

SIGNATURE

Name

Chief, Planning Division

Office Symbol

Date

¹ Only needed if some portion of the ATR was contracted.

ATTACHMENT 3: REVIEW PLAN REVISIONS

Table 9: Review Plan Revisions

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

Table 10: Standard Acronyms and Abbreviations

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
CWA	Clean Water Act	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DQC	District Quality Control/Quality Assurance	OEO	Outside Eligible Organization
EA	Environmental Assessment	PCX	Planning Center of Expertise
EC	Engineer Circular	PDT	Project Delivery Team
EIS	Environmental Impact Statement	PL	Public Law
EO	Executive Order	PMP	Project Management Plan
ER	Engineer Regulation	POH	U.S. Army Corps of Engineers, Honolulu District
FRM	Flood Risk Management	POD	U.S. Army Corps of Engineers, Pacific Ocean Division
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMC	Risk Management Center
IEPR	Independent External Peer Review	RMO	Review Management Organization
IWR	Institute of Water Resources	SAR	Safety Assurance Review
MCX	Mandatory Center of Expertise	USACE	U.S. Army Corps of Engineers
MSC	Major Subordinate Command	WRDA	Water Resources Development Act