



DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, U.S. ARMY CORPS OF ENGINEERS
573 BONNEY LOOP, BUILDING 525
FORT SHAFTER, HAWAII 96858-5440

CEPOD-PDC (1105)

MEMORANDUM FOR Commander, Honolulu Engineer District (CEPOH-PPC/Cindy Acpal), Building 230, Fort Shafter, HI 96858-5440

SUBJECT: Review Plan Approval for the Merizo, Guam Flood Risk Management (FRM) CAP Section 205 Feasibility Study

1. References:

- a. Engineering Regulation 1165-2-217, Civil Works Review Policy, 1 May 21.
- b. HQ POD, CE-POD-PDC memorandum (Delegation of Approval Authority for Review Plans for Civil Works Products), 13 Jun 2024.
- c. Merizo, Guam Flood Risk Management (Section 205) Review Plan (Encl).

2. The Pacific Ocean Division is the lead office to execute this Review Plan. The Review Plan does not include Independent External Peer Review or Safety Assurance Review.

3. I hereby approve this Review Plan, which is subject to change as circumstances require, consistent with work product development under the Project Delivery Business Process. Subsequent revisions to this Review Plan or its execution due to significant changes in the study/scope or level of review will require Division Commander written approval.

4. POC is Mr. Russell Iwamura, Team Leader for Planning and Policy, Pacific Ocean Division, at 808-835-4625 or at Russell.K.Iwamura@usace.army.mil.

Encl


JOSE E. SANCHEZ, P.E., SES
Director, Regional Business

13 Aug 2024

Review Plan
July 2024

1. Project Summary

Project Name: Merizo, Guam Flood Risk Management (FRM) CAP Section 205 Feasibility Study

Location: Merizo, Guam

P2 Number: 484634

Decision and Environmental Compliance Document Type: Integrated Feasibility Report and Environmental Assessment (IFR/EA)

Congressional Authorization Required: No

Project Purpose(s): Flood Risk Management

Non-Federal Sponsor: Government of Guam, represented by Guam Department of Public Works

Points of Public Contact for Questions/Comments on Review Plan:

District: Honolulu District

District Contact: Project Manager, (671) 727-2491

Major Subordinate Command (MSC): Pacific Ocean Division (POD)

MSC Contact: POD CAP Manager, (808) 835-4621

Review Management Organization (RMO): POD

RMO Contact: Chief of Planning and Policy, (808) 835-4625

Key Review Plan Dates

| | |
|--|--------------------|
| Date of RMO Endorsement of Review Plan | 14 Aug 2024 |
| Date of MSC Approval of Review Plan | 14 Aug 2024 |
| Date of IEPR Exclusion Approval | Pending |
| Has the Review Plan changed since RMO Endorsement? | N/A |
| Date of Last Review Plan Revision | N/A |
| Date of Review Plan Web Posting | Pending |

Milestone Schedule and Other Dates

| | Scheduled | Actual |
|---------------------------------------|------------------|---------------|
| FCSA Execution | | 18 Aug 2023 |
| Tentatively Selected Plan | 30 May 2025 | Pending |
| Release Draft Report to Public | 26 Jun 2025 | Pending |
| Final Report Transmittal | 3 Feb 2026 | Pending |

2. References

Engineer Regulation 1165-2-217 – Water Resources Policies and Authorities – Civil Works Review Policy, 1 May 2021.

Engineer Circular 1105-2-412 – Planning – Assuring Quality of Planning Models, 31 March 2011.

Engineer Pamphlet 1105-2-58 – Planning – Continuing Authorities Program , 01 March 2019.

Planning Bulletin 2013-02, Subject: Assuring Quality of Planning Models (EC 1105-2-412), 31 March 2013.

Office of Management and Budget, Final Information Quality Bulletin for Peer Review, Federal Register Vol. 70, No. 10, January 14, 2005, pp 2664-267

The online USACE Planning Community Toolbox provides more review reference information at: <https://planning.erdc.dren.mil/toolbox/current.cfm?Title=Peer%20Review&ThisPage=Peer&Side=No>.

3. Review Execution Plan

This section describes each level of review to be conducted. Based upon the factors discussed in Section 7, this study will undergo the following types of reviews:

District Quality Control (DQC). All decision documents and accompanying components, including associated appendices, data, analyses, calculations, environmental compliance documents, will undergo DQC. This internal review process covers basic science and engineering work products. It fulfils the project quality requirements of the Project Management Plan (PMP).

Agency Technical Review (ATR). ATR will be performed by a qualified team that is not involved in the day-to-day production of the project/product. These teams will be comprised of certified USACE personnel. The ATR team lead will be from outside the home MSC.

Independent External Peer Review. IEPR may be required for decision documents under certain circumstances. This is the most independent level of review, and is applied in cases that meet criteria where the risk and magnitude of the project are such that a critical examination by a qualified team outside of USACE is warranted. Because this project does not meet any of the mandatory triggers for IEPR and an IEPR review has not been requested, IEPR is not required. A detailed assessment of the need for IEPR is included in Section 7.

Cost Engineering Review. The Cost Engineering Mandatory Center of Expertise (MCX) will review and certify project costs and may delegate the final cost certification at its discretion. The Director's Policy Memo dated 3 Sep 20 delegates the final cost certification and associated documentation for CAP projects to be the cost engineering reviewer assigned to the ATR team. The RMO is responsible for coordinating with the MCX for review assignments and ATR of cost products.

Model Review and Approval/Certification. EP 1105-2-58 specifies that approval of planning models is not required for CAP projects, but planners should utilize certified models if they are available. The ATR certification package for CAP ATR reviews must include an explicit statement that says that models and analyses are used appropriately and in a manner that is compliant with

USACE policy, and they are theoretically sound, computationally accurate, and transparent. ATR certification packages also must address any limitations of applied models or their use.

Policy and Legal Review. All decision documents will be reviewed throughout the study process for compliance with law and policy. ER 1105-2-100 (Appendix H) and DPM CW/DCW memos provide guidance on policy and legal compliance reviews. These reviews culminate in determinations that report recommendations 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.

Public Review. The home District will post the Review Plan and approval memo on the district internet site. Public comment on the adequacy of the Review Plans will be accepted and considered. Additional public review will occur when the report and environmental compliance document(s) are released for public and agency comment.

Quality Assurance Review. POD, as the RMO, has responsibility for Quality Assurance (QA). QA includes verifying that the overall project quality control activities are effective in producing a work product that meets the desired end quality. QA activities include reviewing work performed by the District (including implementation of the DQC and ATR processes) and the ATR Team. The general plan for executing all required independent reviews is outlined in the following two tables.

Table 1 lists each study product to be reviewed. The table provides the schedules and costs for the anticipated reviews. Teams also determine whether a site visit will be needed to support each review. The decisions about site visits are documented in the table. As the review plan is updated the team will note each review that has been completed.

Table 2 identifies the specific expertise and role required for the members of each review team. The table identifies the technical disciplines and expertise required for members of review teams. In most cases the team members will be senior professionals in their respective fields. In general, the technical disciplines identified for a District Quality Control (DQC) team will be needed for an Agency Technical Review (ATR) team. Each ATR team member will be certified to conduct ATR by their community of practice. The table is set up to concisely identify common types of expertise that may be applicable to one or more of the reviews needed for a study.

Table 1: Schedule and Costs of Reviews

| Product to undergo Review | Review Level | Site Visit | Start Date | End Date | Cost | Complete |
|---|---|-------------------|-------------------|-----------------|-------------|-----------------|
| Draft Feasibility Report / EA | District Quality Control (DQC) | No | 1/24/25 | 3/28/25 | \$24,000 | No |
| Draft Feasibility Report / EA | Agency Technical Review (ATR) Comments Received | No | 3/31/25 | 5/12/25 | \$40,000 | No |
| Draft Feasibility Report / EA | Public Comment under National Environmental Policy Act | No | 6/27/25 | 7/29/25 | N/A | No |
| Draft Feasibility Report / EA | Policy and Legal Compliance Review | No | 6/27/25 | 8/22/25 | N/A | No |
| Draft Feasibility Report / EA | ATR Backcheck and Closeout | No | 6/27/25 | 7/18/25 | \$10,000 | No |
| Final Feasibility Report / EA | DQC | No | 1/7/26 | 1/20/26 | \$12,000 | No |
| Final Feasibility Report / EA | Policy and Legal Compliance Review | No | 2/6/26 | 3/23/26 | N/A | No |
| Final Feasibility Report / EA | Release Final Report under National Environmental Policy Act | No | 4/7/26 | 4/20/26 | N/A | No |
| Review Management Organization – Coordination and Participation | The RMO will participate in most key meetings including In-Progress Reviews, Issue Resolution Meetings and SMART Milestone Meetings | No | N/A | N/A | \$4,000 | No |

Table 2: Review Teams - Disciplines and Expertise

| Discipline / Role | Expertise | DQC | ATR |
|-------------------------------------|--|------------|------------|
| DQC Team Lead | Extensive experience preparing Civil Works decision documents and leading DQC. The lead may serve as a DQC reviewer for a specific discipline (planning, economics, environmental, etc.). | Yes | No |
| ATR Team Lead | Professional with extensive experience preparing Civil Works decision documents and conducting ATR. Skills to manage a virtual team through an ATR. The lead may serve on the ATR team for a specific discipline (such as planning, economics, or environmental work). | No | Yes |
| Planning | Skilled water resources planner knowledgeable in complex planning investigations and the application of SMART principle to problem solving. The reviewer should be experienced with plan formulation for Flood Risk Management. | Yes | Yes |
| Economics & Life Safety | Experience with applying theory, methods and tools used in the economic evaluation of water resources projects. The reviewer should be experienced in HEC-FDA and LifeSim modeling for Flood Risk Management. | Yes | Yes |
| Environmental Resources | Experience with environmental evaluation and compliance requirements, national environmental laws and statutes, applicable Executive Orders, and other planning requirements. | Yes | Yes |
| Cultural Resources | Experience with cultural resource survey methods, area of potential effects, National Historic Preservation Act Section 106, and territorial and federal laws pertaining to cultural resource preservation in Guam. | Yes | Yes |
| Hydrology & Hydraulic Engineering | Engineer with experience applying hydrologic and hydraulic principles and technical tools to project planning, design, construction, and operation. This reviewer may also be the reviewer for Climate Preparedness and Resilience. | Yes | Yes |
| Cost Engineering | Experience using cost estimation software; working knowledge of water resource project construction; capable of making professional determinations using experience. | Yes | Yes |
| Civil Engineering | The Civil Engineering reviewer should have experience designing flood risk management projects including typical structural and non-structural features, and have knowledge of feasibility study requirements for flood risk management engineering | Yes | Yes |
| Geotechnical Engineering | The Geotechnical Engineering reviewer should have experience designing flood risk management projects including typical structural and non-structural features. The reviewer should also have experience with risk assessments including the estimation and portrayal of risk. | Yes | Yes |
| Real Estate | Experience developing Real Estate Plans and experience in real estate fee/easement acquisition and residential/business relocations for Federal and/or Federally Assisted Programs for implementation of Civil Works projects. | Yes | Yes |
| Climate Preparedness and Resilience | A member of the Climate Preparedness and Resiliency Community of Practice knowledgeable of inland hydrology climate change assessment policy and practice. This reviewer may also be the reviewer for Hydrology & Hydraulic Engineering. | Yes | Yes |
| Risk and Uncertainty | For decision documents involving hydrologic, hydraulic, and/or coastal related risk management measures, include on the ATR team an expert on multi-discipline flood risk analysis to ensure | No | Yes |

| Discipline / Role | Expertise | DQC | ATR |
|-------------------|---|-----|-----|
| | consistent and appropriate identification, analysis, and written communication of risk and uncertainty. | | |

4. Documentation of Reviews

Documentation of DQC. Quality Control will be performed continuously. A specific certification of DQC completion will be prepared at the base conditions (existing and future), draft and final report stages. Documentation of DQC will follow the District Quality Manual and the MSC Quality Management Plan. DrChecks will be used for documentation of DQC comments. An example DQC Certification statement is provided in ER 1165-2-217, Appendix D. Documentation of completed DQC, to include the DQC checklist, will be provided to the MSC, RMO and the ATR Team leader. The ATR team will examine DQC records and comment in the ATR report on the adequacy of the DQC effort.

Documentation of ATR. DrChecks will be used to document all ATR comments, responses, and resolutions. Comments should be limited to those needed to ensure product adequacy. All members of the ATR team will use the four-part comment structure (see ER 1165-2-217, Section 5). If a concern cannot be resolved by the ATR team and PDT, it will be elevated to the vertical team to resolve using the issue resolution process in ER 1165-2-217, Section 5.9. Unresolved concerns will be closed in DrChecks by noting the concern has been elevated. ATR documentation will include an assessment by the ATR team of the effectiveness of DQC. The ATR Lead will prepare a Statement of Technical Review (see ER 1165-2-217, Section 5.11, and Appendix D), for the draft and final reports, certifying that review issues have been resolved or elevated. ATR will be certified when all concerns are resolved or referred to the vertical team and the ATR documentation is complete.

Documentation of Model Review. EP 1105-2-58 states that approval of planning models is not required for CAP projects. However, approved models will be used when possible. A statement affirming that all models and analyses used in the study are theoretically sound, computationally accurate, and transparent will be included as part of the ATR certification package.

5. Supporting Information

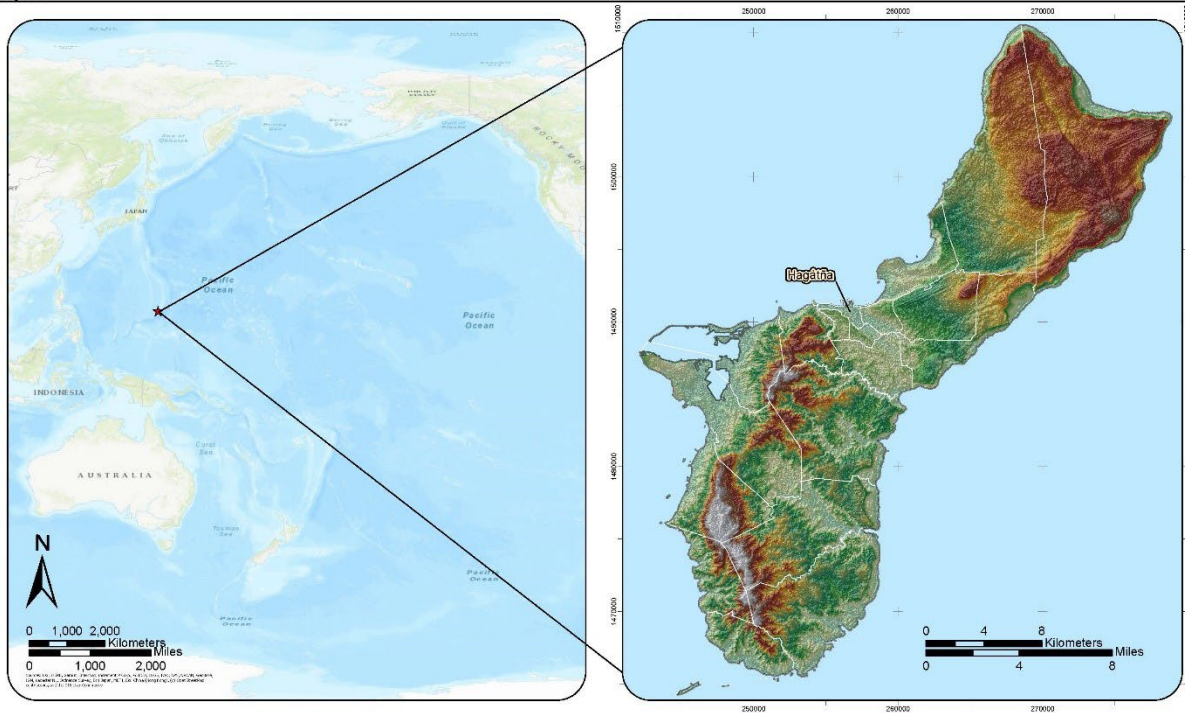
Study or Project Background

Study Authority

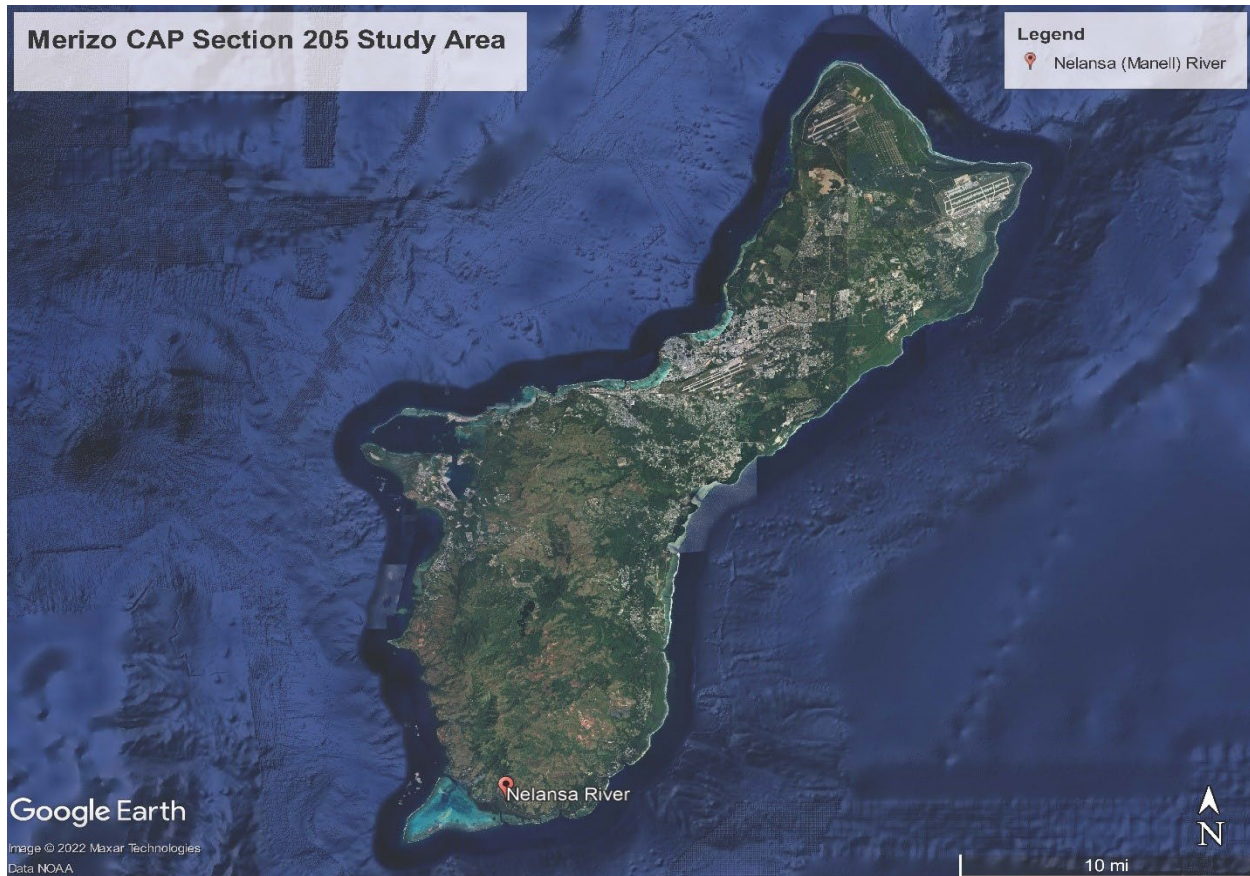
This study is authorized under Section 205 of the Flood Control Act of 1948, as amended, which allows for study, design, and construction of small flood risk management projects in partnership with non-federal government agencies.

Study Area

The Territory of Guam is located approximately 3,800 miles west of Honolulu. Guam is located in the North Pacific Ocean between the Commonwealth of the Northern Mariana Islands (to the north) and the Federated States of Micronesia (to the south) as shown in the figure below. Guam is the largest island in the Mariana Islands and is approximately 30 miles long; 4.0 to 8.5 miles wide; and 209 square miles in area.



The study area is located on the southern coast of Guam in the village of Merizo as shown in the figure below. Merizo is one of 19 municipalities on the Island of Guam and is characterized by less urbanized development than some of its neighboring municipalities.



Problem Statement

Like many places in Guam, the topography of Merizo is characterized by narrow, steep watersheds that flow in overlapping deltaic floodplains. Many streams have been channelized and/or re-directed over the years, leading to hydraulic issues. The streams typically carry a large bed load ranging from silts to boulders and also convey large amounts of vegetation including coconuts, coconut fronds, and bamboo. Because of inadequate, faulty, and/or failing channel and culvert designs, culverts are often clogged during large precipitation events, sometimes as quickly as 45 minutes from the beginning of the event. This causes backflows at constrictions and sheet flow inundation of the area surrounding the channel features.

Preliminary analysis shows that the existing concrete channel is undersized and experiences flooding during very frequent (i.e., 50% AEP) events. During flood events, water is often clogged in culverts resulting in overtopping and discharge of large amounts of water and sediment onto the Route 4, ultimately making it impassable. Upstream erosion is manifested in sediment discharge in the concreted lined reach of the Manell Channel, accumulating along Route 4 and within the concrete channel and culverts. Significant sediment, vegetation, and debris accumulation require frequent removal after every large rain event, increasing local maintenance burdens. Based on local highway maintenance reports, it is estimated that the channel becomes clogged with debris at least 15 to 20 times per year. Finally, based on HEC-RAS modeling for the 1% annual exceedance probability (AEP) flood event, a limited number of residential structures (approximately 25 structures) experience inundation.

Goals and Objectives

Project objectives include the following:

- Reduce flood risks to property and critical infrastructure in the Nelansa (Manell) River basin for the 50-year period of analysis.
- Reduce risk to life safety in the Nelansa (Manell) River basin for the 50-year period of analysis.

Future Without Project Conditions

Modeling results for the future without-project condition indicate floodwaters enter the overbank areas and residential properties as frequently as the 50% AEP flood event due to the narrow channel, low overbanks, and structural constrictions along the river.

Types of Measures/Alternatives Being Considered

The study will evaluate the feasibility of flood risk management measures to reduce flood risk to property and critical infrastructure and to reduce life safety risk associated with flooding in the Nelansa (Manell) River basin. Measures likely to be considered include reforestation, conveyance improvements, detention basins, and nonstructural measures, such as elevation or floodproofing.

Estimated Cost/Range of Costs

The Federal Interest Determination for this feasibility study, completed in September 2022, estimated the cost of a combined structural and nonstructural flood risk management plan for the study area to be approximately \$4 million.

6. Models to be Used in the Study

EP 1105-2-58 states that approval of planning models is not required for CAP projects. However, approved models will be used when possible. A statement affirming that all models and analyses used in the study are theoretically sound, computationally accurate, and transparent will be included as part of the ATR certification package. Planning models are any models and analytical tools used 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 following planning models may be used to develop the decision document:

Table 3: Planning Models

| Model Name and Version | Brief Model Description and How It Will Be Used in the Study | Certification / Approval |
|-------------------------------|---|---------------------------------|
| HEC-FDA 1.4.3 | This certified software provides the capability to perform an integrated hydrologic engineering and economic analysis during the formulation and evaluation of flood risk management plans. HEC-FDA is designed to assist USACE study members | Certified |

| | | |
|---------------------------------------|--|-----------|
| | in using risk analysis procedures for formulating and evaluating flood risk management measures (EM 1110-2-1619, ER 1105-2-101). | |
| LifeSim | The Risk Management Center's (RMC) Life Loss Estimation (LifeSim) software is spatially-distributed dynamic simulation modeling system for estimating potential life loss and direct economic damages from floods. The software will be used to estimate potential life loss. | Certified |
| Regional Economic System (RECONS) 2.0 | The RECONS 2.0 model is a regional economic impact modeling tool developed by the USACE Institute for Water Resources (IWR) to provide accurate and defensible estimates of regional economic impacts associated with Federal expenditures. This modeling tool automates calculations and generates estimates of jobs and other economic measures such as income and sales associated with USACE spending on Civil Works programs and projects. The RECONS 2.0 model incorporates impact area data, multipliers, direct ratios, and geographic capture rates extracted from other planning models utilized to evaluate the economic effects of proposed actions. | Certified |
| IWR Planning Suite (version 2.0.9) | This model assists with formulating plans, cost-effectiveness, and incremental cost analysis. Version 2.0.9 includes the following modules to assist with plan formulation and evaluation: Plan Generator; Cost-Effectiveness and Incremental Cost Analysis (CE/ICA); Annualizer; Multi-Criteria Decision Analysis (MCDA); Uncertainty Analysis; and Watershed Wizard. | Certified |

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. The professional practice of documenting the application of the software and modeling results will be followed. The USACE Scientific and Engineering Technology Initiative has identified many engineering models as preferred or acceptable for use in studies. These models should be used when appropriate. For example, HH&C models need to comply with the requirements of HH&C CoP Enterprise Standard 08101.

These engineering models may be used to develop the decision document:

Table 4: Engineering Models

| Model Name and Version | Brief Model Description and How It Will Be Used in the Study | Approval Status |
|-------------------------------|---|------------------------|
|-------------------------------|---|------------------------|

| | | |
|--|---|---|
| HEC-RAS 6.4.1 or later (Flood Damage Reduction River Analysis Software) | HEC-RAS is a two-dimensional (2D) unsteady flow hydraulic modeling software program developed by the Hydrologic Engineering Center. This model will be used to simulate flow in streams and across the floodplain within the limits of the study area. | HH&C CoP Preferred |
| Microcomputer Aided Cost Engineering System (MCACES), MII | MCACES is the cost estimating software program tools used by cost engineering to develop and prepare Class 3 CW cost estimates. | CW Cost Engineering MCX mandatory |
| Abbreviated Risk Analysis, Cost Schedule Risk Analysis | Cost risk analyses identify the amount of contingency that must be added to a project cost estimate and define the high-risk drivers. The analyses will include a narrative identifying the risks or uncertainties. During the alternative's evaluation, the PDT will assist the cost engineer in defining confidence/risk levels associated with the project features within the abbreviated risk analysis. For the Class 3 estimate, an evaluation of risks will be performed using Crystal Ball Abbreviated Risk Analysis for projects under \$40 million. | CW Cost Engineering MCX mandatory |
| Total Project Cost Summary (TPCS) | The TPCS is the required cost estimate document that will be submitted for division approval. The Total Project Cost for each CW project includes all Federal and authorized non-Federal costs represented by the CW Work Breakdown Structure features and respective estimates and schedules, including the lands and damages, relocations, project construction costs, construction schedules, construction contingencies, planning, and engineering costs, design contingencies, construction management costs, and management contingencies. | CW Cost Engineering MCX mandatory |

7. Factors Affecting Level and Scope of Review

All planning products are subject to the conduct and completion of District Quality Control. Most planning products are subject to Agency Technical Review and a smaller sub-set of products may be subject to Independent External Peer Review and/or Safety Assurance Review. Information in this section helps in the scoping of reviews through the considerations of various potential risks.

Objectives of the Reviews

Reviews of technical and planning products will be focused on ensuring technical quality to facilitate risk-informed decision making. Due to the unique hydrological conditions, construction methods, and land ownership regime on Guam, special attention will be paid to HEC-RAS modeling, creation of the structure inventory, and HEC-FDA modeling. HEC-RAS was selected as the preferred software for this study for its ability to compute water surface profiles based on two-dimensional, rigid boundary, unsteady flow principles. It is the most widely used river hydraulics model in USACE. This

study does not include advanced sedimentation or groundwater analysis where other software may have the advantage. The Flood Risk Management Planning Center of Expertise (FRM-PCX) will be closely involved with review of all technical products. The Cost Engineering Mandatory Center of Expertise (Cost MCX) will be responsible for the review and certification of cost estimates.

Assessing the Need for IEPR

Mandatory IEPR Triggers

- Has the Chief of Engineers determined the project is controversial? No
- Has the Governor of an affected state requested an IEPR? No
- Is the cost of the project more than \$200 million? No

While none of the three mandatory triggers for IEPR have been met, the MSC Commander retains the discretion to conduct IEPR based on a risk-informed assessment of the expected contribution of IEPR to the project.

Discretionary IEPR

A project may be subject to IEPR if another agency requests an IEPR based upon significant adverse environmental impacts.

- Has the head of another Federal agency requested an IEPR? No

Assessing Other Risk Considerations

The questions below help teams and the RMO assess study risks and inform decisions about the potential need for higher level external review. These questions are derived from Section 2034 of the Water Resources Development Act of 2007 (amended) and ER 1165-2-217 Section 6.5.2.

- *Will the study likely be challenging? If so, describe how?*

No. This study does not pose unique technical challenges and there is ample experience within USACE to complete the study. The final integrated feasibility report and supporting documentation will contain standard engineering, economic, and environmental analyses and information that is unlikely to be novel or precedent-setting.

- *Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks.*

Uncertainty regarding real estate costs was documented as a risk for the study and the project in the Federal Interest Determination. Real estate costs for the parcels potentially impacted by project alternatives of \$1 million were included in the FID cost estimates. Real estate risks will be dependent on the alternative selected and the amount of flexibility of the location of the alternative selected. However, the real estate-related risk is high and will require extensive coordination and mitigation with local constituents if the study evaluates a flood risk reduction alternative or measure with a footprint that extends beyond publicly-owned land or right-of-way. The project team will coordinate with local partners in assessing

the acceptability of a particular feature or alternative if private lands may be impacted. The PDT will identify and document real estate and additional risks in a risk register and update this RP to reflect identified risks.

- *Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues? Briefly describe the life risk, including the District Chief of Engineering's assessment as to whether there is a significant threat to human life associated with aspects of the study or failure of the project or proposed projects.*

Based on a qualitative review of existing information, life safety risk appears to be low. However, review of updated H&H modeling will help confirm whether life safety issues exist, and whether the project is likely to be justified by life safety. Finally, the study may introduce incremental risk with the implementation of new levees. If alternatives introduce incremental risk, the study team will address the Tolerable Risk Guidelines per ECB 2019-15 and PB 2019-04.

- *Is the information in the decision document or anticipated project design likely to be based on novel methods, involve 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? If so, how?*

The information in the decision document or anticipated project design is unlikely to contain influential scientific information or be a highly influential scientific assessment as the project is anticipated to involve traditional flood risk management measures such as seawalls and revetments. Standard engineering and environmental information and analyses will be used.

- *Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule? If so, how?*

Not anticipated at this time. The design will take into consideration resilience to sea level change and changing storm conditions due to climate change.

- *Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources? If so, what are the anticipated impacts?*

At this time, the PDT is not aware of the presence of cultural or historic resources in the project area. A cultural resources survey will be conducted to understand whether there are historic or cultural resources in the project area and what, if any, impacts the project alternatives may have on discovered resources, as required for Section 106.

- *Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures? If so, describe the impacts?*

The PDT is peripherally knowledgeable of fish and wildlife species in the project area; however, the extent of each alternative and potential for adverse impacts to resources is as of yet unknown. Biological surveys of the project area will be performed to determine what living resources are in the project area and if the project has the potential to have

substantial adverse impact on such resources. Any recommendation made will be environmentally acceptable and ensure compliance with environmental laws and regulations.

- *Is the project expected to have, before mitigation measures, more than a negligible adverse impact on an endangered or threatened species or their designated critical habitat? If so, what are the anticipated impacts?*

No. Based on knowledge of endangered and threatened species in the project area, more than a negligible adverse impact on endangered or threatened species or their designated critical habitat is not anticipated with the implementation of appropriate mitigation. Upon selection of the TSP, the PDT will be able to adequately evaluate the potential for adverse effects to ESA species and designated critical habitat and determine if more than a negligible adverse impact is anticipated. USACE will ensure close coordination with the Services to ensure full compliance of the project with the Endangered Species Act.

8. Risk Informed Decisions on Level and Scope of Review

Targeted ATR. Will a targeted ATR be conducted for the study? **Yes.** H&H and economics modeling, including HEC-RAS, HEC-FDA, and LifeSim, for the draft report will undergo targeted ATR to ensure technical quality prior to the selection of the TSP.

IEPR Decision. As detailed in Section 7 above, the mandatory triggers for IEPR have not been met and no requests for IEPR have been submitted by federal or state agencies. Based on this assessment and the RIDM considerations outlined in ER 1165-2-217, para. 6.5.2, the District does not recommend an IEPR. The MSC maintains the discretionary authority to revisit the decision to conduct an IEPR should significant adverse environmental impacts be identified during the study.

Decision on Safety Assurance Review. Based on the flooding problems and likely alternatives to be considered and selected, a Safety Assurance Review is not necessary for this project.

9. Policy and Legal Compliance Review

Policy and legal compliance review of draft and final planning decision documents is delegated to the MSC (see Director's Policy Memorandum 2019-01).

(i) Policy Review.

The policy review team is identified by the MSC Chief of Planning. The makeup of the Policy Review team will be drawn from the MSC, the Planning Centers of Expertise, and other review resources as needed.

- The Policy Review Team will be invited to participate in key meetings during the development of decision documents as well as SMART Planning Milestone meetings. These engagements may include In-Progress Reviews, Issue Resolution Conferences or other vertical team meetings plus the milestone events.

- The input from the Policy Review Team should be documented in a Memorandum for the Record (MFR) produced for each engagement with the team. The MFR should be distributed to all meeting participants.
- Teams may choose to capture some of the policy review input in a risk register if appropriate. These items should be highlighted at future meetings until the issues are resolved. Any key decisions on how to address risk or other considerations should be documented in an MFR.

(ii) Legal Review.

Representatives from the Office of Counsel will be assigned to participate in reviews. Members may participate from the District and MSC. The MSC Chief of Planning and Policy will coordinate membership and participation with the office chiefs.

- In some cases, legal review input may be captured in the MFR for the particular meeting or milestone. In other cases, a separate legal memorandum may be used to document the input from the Office of Counsel.

Each participating Office of Counsel will determine how to document legal review input.

10. Public Comment

This Review Plan will be posted on the District's website. Public comments on the scope of reviews, technical disciplines involved, schedules and other considerations may be submitted to the District for consideration. If the comments result in a change to the Review Plan, an updated plan will be posted on the District's website.

11. Documents Distributed Outside the Government

For information distributed for review to non-governmental organizations, the following disclaimer shall be placed on documents:

“This information is distributed solely for the purpose of pre-dissemination review under applicable information quality guidelines. It has not been formally disseminated by USACE. It does not represent and should not be construed to represent any agency determination or policy.”

Appendix A - Brief Description of Each Type of Review

This section describes each level of review to be conducted. Based upon the factors discussed in Section 1, this study will undergo the following types of reviews:

District Quality Control. All decision documents and accompanying components will undergo DQC. This internal review covers basic science and engineering work products. It fulfills the project quality requirements of the Project Management Plan. The DQC team will read all reports and appendices. The review must evaluate the correct application of methods, validity of assumptions, adequacy of basic data, correctness of calculations (error-free), completeness of documentation, and compliance with guidance and standards. Districts are required to check all computations and graphics by having the reviewer place a highlight (e.g., place a “red dot”) on each annotation and/or number indicating concurrence with the correctness of the information shown.

Agency Technical Review. ATR will be performed by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. These teams will be comprised of certified USACE personnel. The ATR team lead will be from outside the home MSC.

Cost Engineering Review. All decision documents will be coordinated with the Cost Engineering Mandatory Center of Expertise (MCX). The MCX assisted in determining the expertise needed on the ATR and if needed, will assist the IEPR. The cost engineering reviewer assigned to the ATR Team will provide the Cost Engineering certification. The RMO is responsible for coordinating with the MCX for the reviews. These reviews occur as part of ATR.

Policy and Legal Compliance Review. These reviews culminate in determinations that report recommendations 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.

Public Review. The District will post the Review Plan and approval memo on the District’s internet site. Public comment on the adequacy of the Review Plans will be accepted and considered. Additional public review will occur when the report and environmental compliance document(s) are released for public and agency comment.