

Oakland Harbor Turning Basins Widening Integrated Feasibility Report and Environmental Assessment REVIEW PLAN January 2021

1. OVERVIEW

This review plan (RP) defines the scope and level of peer review for the following study:

- **Study Name:** Oakland Harbor Turning Basins Widening Study
- **Project Name:** Oakland Harbor
- **P2 Number:** 476976
- **Decision Document Type:** Integrated Feasibility Report and Environmental Assessment (EA)
- **Congressional Approval Required:** Yes
- **Project Type:** Single-Purpose Deep Draft Navigation (DDN)
- **District:** San Francisco (SPN)
- **Major Subordinate Command (MSC):** South Pacific Division (SPD)
- **Review Management Organization (RMO):** Deep Draft Navigation Planning Center of Expertise (DDNPCX)
- **Review Plan Contacts:**
 - **District Contact:** Planner, 917-790-8608
 - **MSC Contact:** Policy & Legal Compliance Review Manager, 415-503-6596
 - **RMO Contact:** Review Manager, 251-694-3842

2. KEY REVIEW PLAN DATES

Action	Date - Actual ¹
RMO Endorsement of RP	Pending
MSC Approval of RP	Pending
IEPR Exclusion Approval	Pending
Has RP changed since PCX endorsement?	N/A
Last RP revision ²	N/A
RP posted on District Website	Pending
Congressional notification ³	Pending

¹Date action occurred or 'pending' if not yet approved

²Enter 'none' if no updates have been made since approval

³Date RIT notified Congress of IEPR decisions

3. MILESTONE SCHEDULE

Action	Date - Scheduled	Date - Actual	Status - Complete?
Feasibility Cost Sharing Agreement Signed		22 July 2019	Yes
Alternatives Milestone Meeting (AMM)	22 Oct 2020	22 Oct 2020	Yes
Tentatively Selected Plan (TSP)	23 Sep 2021		No
Release Draft Report to Public	18 Nov 2021		No
Agency Decision Milestone (ADM)	21 Apr 2022		No
Final Report Transmittal	27 Jan 2023		No
Chief's Report	25 May 2023		No

4. BACKGROUND

- **Date of Background Information:** January 2021
- **RP References:**
 - Engineer Circular (EC) 1165-2-217, Review Policy for Civil Works (CW), 20 February 2018
 - EC 1105-2-412, Assuring Quality of Planning Models, 31 March 2011
 - Engineer Regulation (ER) 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 November 2007
 - Chief's Memorandum, Delegation of Authority in Section 2034(a)(5)(A) of the Water Resources Development Act of 2007 (WRDA 2007), as amended (33 U.S.C. 2343), 8 January 2018
 - Director's Policy Memorandum (DPM) CW Programs 2018-05, Improving Efficiency and Effectiveness in U.S. Army Corps of Engineers (USACE or Corps) CW Project Delivery (Planning Phase and Planning Activities), 3 May 2018
 - Director of Civil Works (DCW) Memorandum, Delegation of Model Certification, 11 May 2018
 - DCW Memorandum, Revised Delegation of Authority in Section 2034(a)(5)(A) of WRDA 2007, as amended (33 U.S.C. 2343), 7 June 2018
 - Planning Bulletin (PB) 2018-01, Feasibility Study Guidelines, 26 September 2018
 - DPM 2019-01, Policy and Legal Compliance Review, 9 January 2019
 - DCW Memorandum, Revised Implementation Guidance for Section 1001 of the Water Resources Reform and Development Act of 2014, Vertical Integration and Acceleration of Studies as Amended by Section 1330(b) of WRDA 2018, 25 March 2019
 - DCW Memorandum, Interim Guidance on Streamlining IEPR for Improved CW Product Delivery, 5 April 2019
 - Section 203 of WRDA 1986, Study authority for the original study completed in 1999
 - Section 101(a) of WRDA 1999, Oakland Harbor Study recommended plan authorized for construction
 - Initial Appraisal Report, Section 216 of the River and Harbor Act of 1970
 - Oakland Harbor Turning Basins Widening Study Project Management Plan, 12 November 2020
 - SPD Quality Management Plan, 2018
- **Study Authority:** This Oakland Harbor Turning Basins Widening Study is authorized by Section 216 of the Flood Control Act of 1970 (33 U.S. Code §549a) which reads, "*The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operations of projects the construction of which has been completed and which were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to significantly changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying the structures or their operation, and for improving the quality of the environment in the overall public interest.*" The original Oakland -50-foot mean lower low water (MLLW) study was conducted pursuant to the authority provided by the Congress of the United States through Section 203 of WRDA 1986 (P.L. 99-662).
- **Sponsor:** Port of Oakland

- **SMART Planning Status:** This is a 3x3x3 compliant study currently post-AMM in the alternative evaluation and analysis phase.
- **Project Area:** The Oakland Harbor Federal project includes the Entrance Channel, the Outer Harbor Channel, the Brooklyn Basin South Channel, the Brooklyn Basin North Channel, and the Tidal Canal (Figure 1). The Oakland Inner and Outer Harbors are located on the eastern side of the San Francisco Bay in the counties of Alameda and San Francisco, California. The Outer Harbor channel is located immediately south of the San Francisco-Oakland Bay Bridge and is maintained to a depth of -50 feet MLLW. It provides access to the Port of Oakland's berthing areas, which serve container, break-bulk, and roll-on/roll-off deep-draft vessels. The Inner Harbor is also maintained to -50 feet MLLW through the Howard Terminal, which is approximately 2.5 miles from the Inner Harbor entrance. The study area is the existing Oakland Harbor federal navigation channel and immediately surrounding areas, specifically focusing on improvements to the harbor's turning basins. Existing Federal project dimensions are provided below.

Channel	Depth (feet) MLLW	Length (feet)	Width (feet)
Entrance Channel	-50	3,600	900
Outer Harbor Channel	-50	16,500	900
Inner Harbor Channel	-50	20,000	800
Brooklyn Basin South Channel	-35	14,300	600
Brooklyn Basin North Channel	-25	5,000	450
Tidal Canal	-18	7,900	300

- **Problem Statement:** The design vessel for the existing project was a 1,139-foot long 6,500 twenty-foot equivalent unit (TEU) containership vessel. Today, vessels with more than double the capacity of the original design vessel call at the Port. Since 2014 the Harbor has experienced a significant shift in the containership vessel fleet calling on the port. In 2014, the fleet was largely comprised of Sub-Panamax, Panamax, and Post Panamax (PPX) Generation (Gen) I vessels (71 percent). By 2019, 75 percent of the containership vessel fleet had transitioned to PPX Gen I, PPX Gen II, and PPX Gen III vessels.

Year	Sub-Panamax	Panamax	PPX Gen I	PPX Gen II	PPX Gen III	PPX Gen IV	Total
2014	109	485	518	273	174	0	1,558
2015	76	277	424	268	208	0	1,252
2016	112	316	508	378	247	3	1,563
2017	99	232	492	416	205	0	1,442
2018	96	163	498	398	231	0	1,386
2019	175	140	352	371	210	0	1,248

In early 2016, an 18,000 TEU container vessel, the *CMA CGM Benjamin Franklin*, called at the Port in anticipation of PPX Gen IV vessels being deployed on Asia-West Coast routes. This PPX Gen IV vessel has a length overall of 1,310 feet, a breadth of 178 feet, and a design draft of 52.5 feet. It was able to call at the Port but required substantial restrictions and was not able to use the Harbor's turning basins due to its size.

The existing fleet is transitioning to containerships with greater capacity and larger dimensions. Without improvements, ships at Oakland Harbor will not realize economies of scale. Operational inefficiencies will be compounded by the future fleet.

- **Study/Project Goals and Objectives:** The planning objective for the study is to achieve transportation cost savings through increased economic efficiencies of vessels using the turning basins in Oakland Harbor over the 50-year period of analysis. The study goal is to determine if there is a technically feasible, economically justifiable, and environmentally acceptable recommendation for federal participation in a navigation improvement project for the Oakland Harbor.
- **Description of Action:** SPN and SPD outlined the scope of the current study, focusing the analysis around the existing federal navigation channel in the Oakland Harbor. A range of structural and non-structural measures were considered for addressing identified study problems (turning basin widening, channel deepening, additional tug assist, timing of vessel transits, and lightering). However, following initial screening efforts the only measure to continue forward was turning basin improvements. Maintenance dredging of the Entrance Channel, Outer Harbor Channel, and Inner Harbor Channel typically occurs annually. Dredged material from Oakland Harbor has historically been less than 80 percent sand. Prior to 1999, all operation and maintenance dredged material from Oakland Harbor was placed at the SF-11 unconfined aquatic placement site. Since 1999, the material has been placed at the San Francisco Deep Ocean Disposal Site (SFDODS), Montezuma Wetlands Restoration Project, Hamilton Wetlands Restoration Project, and SF-11. Any contaminated material that may be encountered while dredging will be placed at an appropriate facility. Ultimately, the proposed action will include the Federal Standard, or least cost, environmentally acceptable, technically feasible dredged material placement plan. The dredged material placement plan shall include SFDODS and upland wetland restoration sites near the project such as Montezuma and Cullinan Ranch. An EA will be prepared to document environmental impacts, specifically those to green sturgeon, salmonids, California least tern, air quality, and shallow subtidal habitat.
- **Federal Interest:** Deep draft navigation is one of the U.S. Army Corps of Engineers' primary mission areas. 33 U.S.C. 540 states, "Federal investigations and improvements of rivers, harbors, and other waterways shall be under the jurisdiction of and shall be prosecuted by the Department of the Army..." Construction of the Oakland Harbor deepening project's channels was completed in 2009 and environmental mitigation is ongoing. In October 2018, an Initial Appraisal Report, in compliance with §216 of the Flood Control Act of 1970, was completed to determine if there was Federal interest to undertake modifications to the existing project. The Initial Appraisal Report found, "The accelerating expansion of the volume of trade that has taken place over the recent past has led to the design vessel in the Oakland Harbor Navigation Improvement (-50-Foot) Feasibility Study being superseded in use in the Port much sooner than expected. This has a material effect on the economic conditions and engineering design incurring economic inefficiency associated with ULCV's operations and navigational safety hazards at Project."¹
- **Risk Identification:** This project has a range of risks. The study considers improvements to be evaluated that will only enhance existing elements of a federal navigation project to

¹ ULCV = Ultra Large Container Vessel

meet changing conditions. However, there are uncertainties as in any study, whether improvements are economically justified, environmentally acceptable, and technically feasible. Based on current information and data, the study is not expected to be significantly challenging, but there are risks given potential federal and the State of California environmental compliance requirements and potential real estate acquisition requirements. These potential risks are similar to those found in other USACE DDN studies or projects and are not expected to inhibit successful implementation of this project. The project will not be justified by life safety considerations and does not involve significant threat to human life. Further information on risks are identified in section 5.B. of this Review Plan.

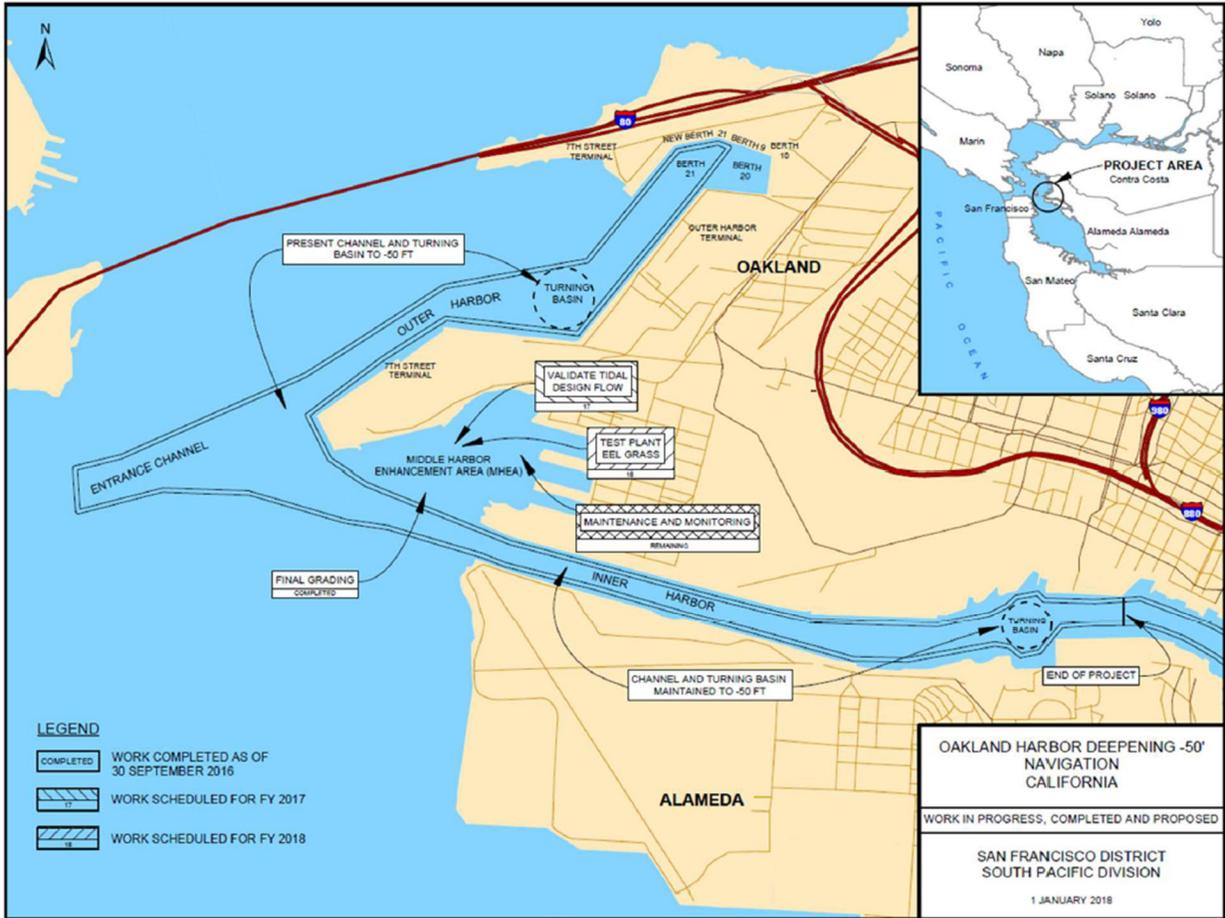


Figure 1: Study Area

5. FACTORS AFFECTING THE LEVELS OF REVIEW

- A. Is it likely that part(s) of the study will be challenging (EC 1165-2-217, paragraph 7.a.(1))? No. It is not likely that the study will be challenging, as it is looking at improvements to a previously authorized and constructed project. There is an abundance of existing information and prior reports available for use in this study effort. The improvement measures are not expected to be technically challenging. The non-federal sponsor, the Port of Oakland, has requested and fully supports the study.

- B. Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks (EC 1165-2-217, paragraph 7.a.(1)). The study will take a risk-informed planning approach. This project has a range of risks. The study is considering the enhancement of existing elements of a Federal navigation project to meet changing conditions. All project and design risks not fully evaluated in the study will be further managed in Preconstruction Engineering and Design. Life safety is not a concern in this navigation study. This RP will be updated, as appropriate, should any of these assessments change during the course of the study.
- Environmental impacts and constraints vary among the array of alternatives and may be significant depending upon the measures recommended; mitigation measures may be costly. The resources most likely to be affected by the components of each alternative being considered and that could potentially require mitigation planning are endangered species; Essential Fish Habitat; water and sediment/dredged material quality; and air quality. Per mitigation guidance, resource agencies prefer any regulated aquatic habitat impacts be mitigated in-place and in-kind. If appropriate mitigation opportunities are unavailable, plans may not be environmentally acceptable. The study currently assumes an Environmental Assessment and (mitigated) Finding of No Significant Impact (FONSI) will be appropriate under the National Environmental Policy Act (NEPA). This is a high-risk assumption based on initial feedback from resource agencies. Unavoidable significant effects would require an Environmental Impact Statement (EIS) under NEPA.
 - Existing bathymetric and geotechnical data are being used; use of existing data may impact the accuracy of design and cost estimates, specifically estimates beyond the footprint of the existing channel. This risk is moderate and appropriate contingencies will be included in the cost estimate. This level of information may affect the resolution of potential impacted habitat.
 - The fleet forecast may include containership yet to call Port of Oakland. Loading assumptions must be made using information from smaller vessel classes. The fleet forecast will be estimated using available U.S. forecast and other West Coast port forecasts. Fleet forecast can affect the benefits and may affect the selection of the Tentatively Selected Plan. The risk is moderate because alternatives will be affected equally; this method is consistent with methods used in other USACE DDN studies.
 - The benefits of decreased risk of collisions, allisions, and groundings are not being calculated. This will increase the chance of no plan being economically justified. The risk is low and is consistent with USACE DDN studies.
 - The project team is currently proposing to defer dredged material characterization and analysis to the Preconstruction Engineering and Design phase and to use existing operation and maintenance (O&M) sediment testing data in the feasibility phase. There is potential for some of the dredged sediments to be contaminated; however, it is not anticipated that the project would encounter aquatic sediment classified as HTRW. Multiple resource agencies expressed concern with deferring aquatic sediment characterization until after the feasibility study phase due to the risk of encountering contaminated material, particularly around the inner harbor turning basin. Agencies expressed concern that USACE may be unable to properly formulate/differentiate between alternatives without this information. Furthermore, the Environmental Protection Agency (EPA) suggested they may characterize the NEPA document as inadequate if targeted sediment characterization is not included for impact analyses. Assuming the use of existing data, including O&M sediment testing data, will be adequate for environmental analysis of alternatives and for obtaining necessary

environmental compliance from resource agencies is a high risk. To mitigate this risk, the project team is coordinating early and often with the resource agencies on this matter. Appropriate placement of dredged material may be costly if contaminated sediment is encountered and requires upland disposal. This risk is moderate and appropriate contingencies will be included in the cost estimate.

- It is assumed that hazardous, toxic, and radioactive waste (HTRW) may be encountered if land acquisition is required for project implementation (i.e., project footprint expanded to include land adjacent to the existing turning basin). If encountered, HTRW would increase the costs of implementing the project. Incorrect assumptions regarding HTRW could affect the selection of the Tentatively Selected Plan; this is a medium risk. Existing data and coordination will occur to formulate alternatives to avoid, where feasible, suspected sites with HTRW. Appropriate contingencies will be incorporated.
- Maintaining structural and slope stability of the turning basins may be costly for a recommended plan because of the potential need for sheet piling and stabilization measures. This risk is moderate and appropriate contingencies will be included in the cost estimate.
- Ship simulation modeling and hydrologic/hydraulic modeling are being deferred to the Preconstruction Engineering and Design Phase. The risk of this decision affecting the selection of the Tentatively Selected Plan is low because a review of the existing information will provide suitable information for a feasibility-level analysis.
- The recommended plan will likely require real estate acquisition. There is a moderate risk that acquisition of the required real estate may be time consuming and costly if land is acquired in Alameda. Appropriate contingencies will be applied to real estate costs.
- This will be a 3x3 compliant study. There is a medium risk the report/analyses may not be of sufficient quality to be acceptable and that a significant number of comments may be received during document reviews. The team will do their best to ensure quality given the time and money constraints.

- C. Is there a significant threat to human life associated with aspects of the study or with failure of the project or proposed project (Type I IEPR - EC 1165-2-217, paragraph 11.d(1)(a) and SAR - paragraph 12.h.)? No. The feasibility study is not looking to recommend a plan to reduce flooding or life safety risk. Channel improvements will be justified through a savings in transportation costs and will not be justified by life safety. There are no significant threats to human life associated with either construction of the proposed improvements, O&M of the proposed project, or with project failure. Should the project not perform as expected, the impact would be a lower than expected benefit to National Economic Development, which does not impact human life and/or safety. Non-performance of the project would not affect the well-being of the general public and/or environment but may negatively affect transportation costs for commodities moving through area facilities. There is no residual risk to account for in this project due the fact that the project purpose does not address or directly affect human health and safety. This life safety assessment has been reviewed by the SPN Chief of Engineering and has his concurrence.
- D. Is the estimated total cost of the project greater than \$200 million (EC 1165-2-217, paragraph 11.d(1)(b))? Based upon best available information and professional judgement, the estimated total project cost is assumed to be less than \$200 million.

- E. Will the study/project require an environmental impact statement (EC 1165-2-217, paragraph 11.d(1)(b))? The project delivery team (PDT) is currently assuming an EA will be sufficient under NEPA. However, given agency input received at the study's kickoff Resource Agency Working Group meeting, the probability of elevation to an EIS is high, and the risk to maintaining the project 3x3x3 schedule and budget would be high if an EIS is required. Resource agencies expressed particular concern regarding contaminated sediment suspension and the potentially significant effects on water quality and aquatic habitat and species including special status species and essential fish habitat. Additionally, resource agencies expressed concern about potentially significant impacts to marine mammals if pile driving is involved in alternatives to widen the turning basin. USACE assessment of the significance of the potential environmental impacts of the alternatives in the final array carried forward for analysis will determine if an EIS is necessary. Unavoidable significant effects would require an EIS under NEPA. This determination will be made prior to the tentatively selected plan (TSP) milestone when the final array is identified. Should an EIS be required, this RP will be updated to reflect the change in project scope.
- F. Has the Governor of an affected state requested a peer review by independent experts (EC 1165-2-217, paragraph 11.d(1)(c))? There has not been a request for independent peer review by the Governor of California.
- G. Has the Chief of Engineers determined that the project study is controversial due to significant public dispute over the size, nature, or effects of the project or the economic or environmental costs or benefits of the project (EC 1165-2-217, paragraph 11.d(1)(d))? No, the study/project is not likely to involve significant public dispute as to its size, nature, or effects of the project or its economic or environmental costs or benefits as improvements are proposed to an existing port/channel. The previous -50-foot project was not controversial, and this study/project is anticipated to be the same.
- H. Is the study/project likely to involve significant public dispute as to the project's size, nature, or effects (EC 1165-2-217, paragraph 11.d(1)(e))? The study/project is not likely to involve significant public dispute as to its size, nature, or effects of the project due to the fact that it is only an evaluation of modifications to an existing feature of the authorized and constructed project. The improvements being considered would only be recommended if economically justified, environmentally acceptable, and technically feasible. The identification and evaluation of measures and components were informed by discussions with the local pilots and environmental cooperating and participating agencies. A Resource Agency Working Group meeting with invited NEPA cooperating and participating agencies and tribes was held on October 8, 2020 to present the study to the participants and receive initial feedback and input. Specific aspects of the study approach and potential for alternatives to affect resources were of concern to resource agencies and will require additional coordination. These aspects include testing and placement of dredged material; contaminated material, in water or upland, that may lie within the footprint of potential turning basin locations; air quality; water quality; and special status species and habitats.
- I. Is the study/project likely to involve significant public dispute as to the economic or environmental cost or benefit of the project (EC 1165-2-217, paragraph 11.d(1)(f))? The study/project is not likely to involve significant public dispute as to the economic cost or benefit of the project. The non-federal sponsor and the maritime community support the

project as improvements would increase the economic efficiency of vessel/port operations thus providing benefits to the nation through reduced transportation costs. USACE expects interest from agencies and the public regarding environmental considerations; through early and often communication, USACE expects concerns will be minimized. The improvements being considered would only be recommended if economically justified, environmentally acceptable, and technically feasible.

- J. Is the information in the decision document or anticipated project design likely to contain influential scientific information or be a highly influential scientific assessment – i.e., 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 (Type I IEPR - EC 1165-2-217, paragraph 11.d(1)(g); SAR paragraph 12.i.(1); and paragraph 15.d)? No; the evaluation of navigation improvements is not likely to be based on novel methods, involve the use of innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices. The project will involve traditional methods of dredging and placement of dredged material. Standard engineering, economic, and environmental information and analyses will be used.
- K. Does/will the study/project have significant interagency interest (EC 1165-2-217, paragraph 7.f(1))? The project is not expected to have significant interagency interest. The previous -50-foot project did not have significant interagency interest, and this study/project is anticipated to be the same. During development of the NEPA document and in accordance with the requirements of all applicable Federal environmental laws, SPN will coordinate with relevant state and federal resource agencies to address such interest.
- L. Are there any other circumstances that would lead the Chief of Engineers to determine Type I IEPR is warranted (EC 1165-2-217, paragraph 11.d(1)(h))? No. There are no other circumstances that would lead the Chief of Engineers to determine that Type I IEPR is warranted.
- M. Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources (EC 1165-2-217, paragraph 11.d(4)(a))? The project is not currently expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources. The existing federal project has been in continuous use for more than 50 years and undergoes regular and routine dredging to maintain the current 50 foot depth. No cultural resources have been reported within the federal channel and the immediately surrounding areas where improvements may occur. Adverse effects to National Register eligible properties, if present in the area of potential effects (APE), will be mitigated in accordance with the National Historic Preservation Act. The improvements being considered would only be recommended if economically justified, environmentally acceptable, and technically feasible. The recommended plan would be coordinated with appropriate agencies and tribes. Depending on the potential for presence of cultural resources in the APE and the adequacy of existing cultural surveys, a Memorandum of Agreement or Programmatic Agreement, as appropriate, will be prepared for the recommended plan.
- N. Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures (EC 1165-2-217, paragraph

11.d(4)(a))? The project is unlikely to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures. The study will avoid impacts where possible and/or use best practices to minimize impacts (e.g., using environmental buckets and silt curtains should areas with contaminated material be encountered). Any recommendation made will be environmentally acceptable and ensure compliance with environmental laws and regulations.

- O. 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 (EC 1165-2-217, paragraph 11.d(4)(a))? Endangered and threatened species and their designated critical habitat are present in the study area, including multiple salmonid species and their critical habitat, green sturgeon and its critical habitat, and California least tern. The project may have more than a negligible adverse impact on these species or their designated critical habitat prior to the implementation of mitigation measures. Avoidance of adverse environmental impacts will be considered. However, such effects will be appropriately coordinated with the resource agencies and jeopardy to such species or their designated critical habitat is not expected. Any recommendation made will be environmentally acceptable and ensure compliance with environmental laws and regulations.
- P. Does the project study pertain to an activity for which there is ample experience within the USACE and industry to treat the activity as being routine (EC 1165-2-217, paragraph 11.d(4)(b))? Yes, the final integrated feasibility report and supporting documentation will contain standard engineering, economic, and environmental analyses and information. The proposed project is for dredging and will include the Federal Standard, or least cost, environmentally acceptable, technically feasible dredged material placement plan including SFDODS and upland wetland restoration sites near the project such as Montezuma and Cullinan Ranch, for which there is ample experience within the USACE and industry to be considered routine. Novel methods will not be utilized, and methods, models, or conclusions will not be precedent setting or likely to change policy decisions.
- Q. Does the project study have minimal life safety risk (EC 1165-2-217, paragraph 11.d(4)(b))? The project will not be justified by life safety considerations and does not involve a significant threat to human life. The project involves negligible life safety risk; standard dredging techniques are proposed consistent with those used in the authorized project for channel maintenance. No unique or special equipment that would introduce uncertainties or additional risk to life safety is needed to complete proposed project construction.
- R. Does the project design require redundancy, resiliency, and/or robustness (EC 1165-2-217, paragraph 12.i.(2))? The project design is not anticipated to require redundancy, resiliency and/or robustness, unique construction sequencing, or a reduced or overlapping design construction schedule as project design will follow standard dredging and placement techniques used throughout USACE and industry.
- S. Will the project have unique construction sequencing or a reduced or overlapping design construction schedule (e.g., significant project features will be accomplished using the Design-Build or Early Contractor Involvement delivery systems) (EC 1165-2-217, paragraph 12.i.(3))? No. The project design will follow standard dredging and placement methodologies typically conducted by the District for navigation projects. As such the project design is not anticipated

to require unique construction sequencing or a reduced or overlapping design construction schedule.

6. REVIEW EXECUTION PLAN

This RP section provides a general description of each level of review. Sub-sections that follow identify the reviews anticipated for this study.

A. Types of Review

- 1) **District Quality Control (DQC)**. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements of the project management plan. All decision documents (including data, analyses, environmental compliance documents, etc.) undergo DQC review. Additionally, DQC of milestone submittals is required (PB 2018-01, Feasibility Study Milestones).
- 2) **Agency Technical Review (ATR)**. ATR is performed to assess whether study/project analyses are technically correct and comply with USACE guidance and whether documentation explains the analyses and results in a clear manner. Further, the ATR team will ensure that proper and effective DQC has been performed (as assessment of which will be documented in the ATR report) and will ensure that the product is consistent with established criteria, guidance, procedures, and policy. If significant life safety issues are involved in a study or project, a safety assurance review should be conducted during ATR. At a minimum, ATR of the draft and final decision documents and supporting analyses is required (EC 1165-2-217, paragraph 9.i.(3)); however, targeted reviews may be scheduled as needed.
- 3) **Independent External Peer Review**. Type I 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 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 is made as to whether Type I IEPR is appropriate. If the District anticipates requesting an exclusion from Type I IEPR, that effort should be coordinated with the RMO for assessment prior to submitting to the MSC for approval. Should IEPR be required, the RMO should be contacted at least three months in advance of the anticipated start of the concurrent review period to allow sufficient time to obtain contract services. If required, Type I IEPR will be managed by an Outside Eligible Organization, external to USACE. Neither the public nor scientific or professional societies would be asked to nominate potential external peer reviewers. Contract costs for IEPR are 100 percent Federal cost; costs for the DDNPCX RMO, Contracting Officer Representative, and USACE contract administration are cost shared. Summary costs are shown in Table 1 without breakout by funding source.
- 4) **Cost Engineering Review**. All decision documents will be coordinated with the Cost Engineering Mandatory Center of Expertise (MCX). The MCX will provide the cost engineering expertise needed on the ATR team and will provide certification of cost estimates. The RMO is responsible for coordinating with the MCX for cost reviews. Cost reviews may occur as part of the draft/final report ATRs, but the schedule for specific reviews may vary. Accordingly, the PDT should coordinate review related needs with both the MCX and RMO.

- 5) **Model Review and Approval/Certification.** EC 1105-2-412 established the process and requirements for ensuring the quality of planning models. The EC mandates use of certified or approved planning models for all planning activities to ensure that planning products are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions regarding the availability of data, transparent, and described in sufficient detail to address any limitations of the model or its use.
- 6) **Policy and Legal Compliance Reviews (P&LCRs).** 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 determination whether report recommendations, supporting analyses, and coordination comply with law and policy and whether the decision document warrants approval or further recommendation to higher authority by the home MSC Commander.
- 7) **Public Review.** The home District will post the RMO endorsed and MSC approved RP on the District's public website. Internet posting of the RP provides opportunity for the public to comment on that document. It is not considered a formal comment period, and there is no set timeframe for public comment. The PDT should consider any comments received and determine if RP revisions are necessary. During the public comment period, the public will also be provided with the opportunity to review and comment on the draft and final reports. Should IEPR be required, public comments will be provided to the IEPR panel for consideration.

B. Anticipated Project Reviews and Estimated Costs

Table 1 provides the estimated schedules and costs for reviews anticipated for this study.

Table 1: Oakland Harbor Turning Basins Widening – Anticipated Reviews

Products to undergo Review	Review Level	Start Date	End Date	Cost	Complete
Pre-TSP Milestone Submittals	DQC	9 September 2021	15 September 2021	\$5,000	No
Draft Feasibility Report and EA ²	DQC	8 October 2021	04 November 2021	\$35,000	No
	ATR	19 November 2021	20 January 2022	\$60,000	No
	Type I IEPR	N/A	N/A	N/A	N/A
	P&LCR	19 November 2021	20 January 2022	N/A	No
Final Feasibility Report and EA ³	DQC	21 October 2022	17 November 2022	\$20,000	No
	ATR	18 November 2022	23 December 2022	\$50,000	No
	P&LCR ²	30 January 2023	01 March 2023	N/A	No
In-kind Products ⁴	N/A	-	-	-	-

² Estimated cost for Draft and Final Report ATRs does not include the cost of ATR Team Lead participation in milestone meetings or other engagement/coordination beyond that directly related with those ATRs. The estimated cost for ATR of the Draft Report is based upon the following assumptions. It is noted that these are estimated costs and could be higher or lower depending upon many factors including quality of documents submitted for review, reviewer grade, etc.:

- ATR Team Lead – 32 hours, \$125/hour
- ATR Team – 10 Technical Disciplines, 40 hours/discipline, average \$125/hour
- RMO – 40 hours, \$151/hour

³ The estimated cost for ATR of the Final Report is based upon the following assumptions:

- ATR Team Lead – 32 hours, \$125/hour
- ATR Team – 10 Technical Disciplines, 32 hours/discipline, average \$125/hour
- RMO – 40 hours, \$151/hour

⁴ Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR; however, no in-kind products or analyses are anticipated for this project. Should such change, the PDT will review these products before they are sent to DQC, ATR, and IEPR. The DQC, ATR, and IEPR costs in the table reflect the inclusion of these products.

C. District Quality Control

The home district shall manage DQC and will appoint a DQC Lead to manage the local review (see EC 1165-2-217, section 8.a.1).

1) **Review Team Expertise.** Table 2 identifies the required expertise for the DQC team.

Table 2: Required DQC Expertise

DQC Team Disciplines	Expertise Required
DQC Lead	A senior professional with extensive experience preparing Civil Works decision documents and conducting DQC. The lead may also serve as a reviewer for a specific discipline (e.g., planning, economics, etc.).
Plan Formulator	The plan formulator reviewer should be a senior water resources planner with experience in formulation of DDN studies and evaluation of dredged material placement requirements.
Economics ⁵	The economics reviewer should be a senior economist with experience in DDN studies and be familiar with economic models identified in Table 5, general study requirements, and the plan formulation process.
Environmental Resources and Cultural Resources	The environmental reviewer should have expertise in the environmental and cultural impacts associated with navigation projects and dredging as well as extensive knowledge of estuarine and coastal ecology. The reviewer should also be familiar with the environmental coordination and NEPA requirements for DDN projects and dredged material sampling and testing; dredge material placement analyses; land based HTRW; and the environmental model identified in Table 5.
Hydrology, Hydraulic, and Coastal (HH&C) Engineering	The HH&C engineering reviewer should be an expert in the field and have a thorough understanding of open channel dynamics, channel design, and dredged material placement requirements. The reviewer must be familiar with the application of USACE risk and uncertainty analyses and sea level rise, sedimentation, and water quality evaluations.
Civil/Design Engineering	The civil/design engineering reviewer should be an expert in the field of channel design, have a thorough understanding of open channel dynamics, and have experience in DDN studies/projects and dredged material placement requirements.
Geotechnical Engineering	The geotechnical engineering reviewer should be an expert in the field and have an understanding of the behavior of soils, site characterization, material management, slope stability, open channel dynamics, have experience in DDN studies/projects, dredged material placement, and with the model identified in Table 6.
Cost Engineering	The cost engineering reviewer should be an expert in the field, be certified by the Cost Engineering MCX, and have experience in DDN studies/projects and the cost engineering models identified in Table 6.
Construction/Operations	The operations reviewer should have expertise in the design, construction, and O&M of DDN projects and dredged material placement sites.
Real Estate	The real estate reviewer should have expertise in the real estate requirements of DDN projects and the implications of encountering HTRW.

⁵ The economics DQC team member will be identified by the DDNPCX (OPORD 2012-15).

2) **Documentation of DQC.** Quality Control should be performed continuously throughout the study. A specific certification of DQC completion is required at the draft and final report stages. Documentation of DQC should follow the District Quality Manual and the MSC Quality Management Plan. DrChecks software will be used to document DQC review comments, responses, and issue resolution. An example DQC Certification statement is provided in EC 1165-2-217.

Documentation of completed DQC will be provided to the MSC, RMO and ATR Team leader prior to initiating ATR. The ATR team will examine DQC records and comment in the ATR report on the adequacy of the DQC effort. Missing or inadequate DQC documentation can result in delays to the start of other reviews (EC 1165-2-217, Section 9).

D. Agency Technical Review

ATR will be performed on the draft and final decision documents and supporting analyses (EC 1165-2-217, paragraph 9.i.(3)). The RMO will manage the ATR. 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. ATR will be performed by a team whose members are certified or approved by their respective Communities of Practice (CoPs) to perform reviews. The RMO will identify an ATR lead and ATR team members. Neither the home District nor the MSC will nominate review team members. The ATR team lead will be from outside the home MSC. The ATR team lead is expected to participate in the study’s milestone meetings (PB 2018-01), the cost of which is not included in the estimates provided in Table 1. Targeted ATR or review of interim products is not anticipated at this time. Should such be needed, the RP will be updated, as appropriate.

1) **Review Team Expertise.** Table 3 identifies the disciplines and ATR team expertise required for study efforts. Multiple disciplines may be covered by one reviewer.

Table 3: Required ATR Team Expertise

ATR Team Disciplines	Expertise Required
ATR Lead	The ATR Lead will be a senior professional with extensive experience preparing Civil Works decision documents and conducting ATR. The lead should have the skills to manage a virtual team through an ATR. The lead may also serve as a reviewer for a specific discipline (e.g., planning, economics, etc.).
Plan Formulator	The plan formulator reviewer should be a senior water resources planner with experience in leading a team through a DDN channel improvement study and analysis of dredged material placement requirements.
Economics	The economics reviewer should be a senior DDN economist with experience in performing economic evaluations for channel deepening /widening projects. Experience with evaluating containerized trade is required. Two economics reviewers will be required, one to review the economics appendix and the other to review inputs/outputs of economic models identified in Table 5.
Environmental Resources	The environmental reviewer should have expertise in assessing the environmental impacts associated with navigation improvement projects and dredging as well as extensive knowledge of estuarine and coastal ecology. The reviewer should also be familiar with the environmental coordination and NEPA requirements for DDN channel improvement

	projects; dredged material sampling and testing; dredge material placement analyses; land based HTRW ⁶ ; and the environmental model identified in Table 5.
Cultural Resources	The cultural resources reviewer should have expertise in evaluating the impacts associated with DDN channel improvement and dredging projects as well as extensive knowledge of underwater archaeology. The reviewer should also be familiar with the environmental coordination and NEPA/ NHPA requirements for DDN projects.
HH&C Engineering	The HH&C engineering reviewer should be an expert in the field and have a thorough understanding of open channel dynamics, channel design, and dredged material placement requirements. The reviewer must be familiar with the application of USACE risk and uncertainty analyses and sea level rise, sedimentation, and water quality evaluations.
Geologist /Geotechnical Engineer	The reviewer should be an expert in the field and DDN channel improvement projects, including the behavior of soils, site characterization, material management, slope stability, channel design, dredged material placement requirements, and the geotechnical model identified in Table 6.
Cost Engineering	The cost engineering reviewer identified by the MCX should be an expert in the field, certified by the Cost Engineering MCX, experienced in DDN studies/projects and dredged material placement requirements, and expertise with the cost engineering models identified in Table 6.
Operations	The operations reviewer should have expertise in the design, construction, and O&M of DDN studies/projects, including dredged material placement sites.
Real Estate	The real estate reviewer should have expertise in the real estate requirements of DDN projects and the implications of encountering HTRW.
Climate Preparedness and Resiliency CoP/HH&C Climate Reviewer	A member of the Climate Preparedness and Resiliency CoP or an HH&C Climate certified reviewer will participate in the ATR review.

- 2) **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. If a concern cannot be resolved by the ATR team and PDT, it will be elevated to the vertical team for resolution using the EC 1165-2-217 issue resolution process. Concerns can be closed in DrChecks by noting the concern has been elevated for resolution. The ATR Lead will prepare a Statement of Technical Review (EC 1165-2-217, Section 9), for the draft and final reports, certifying that review issues have been resolved or elevated. ATR may be certified when all concerns are resolved or referred to the vertical team and the ATR documentation is complete.

E. Independent External Peer Review

- 1) **Decision on Type I IEPR.** Type I IEPR is managed outside of the USACE and conducted on studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for

⁶ Depending upon the nature of the HTRW concerns, an additional reviewer with that expertise may be required.

integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study.

Based upon best available information and professional judgement, the PDT has assessed this single purpose DDN project and determined that it DOES NOT meet the criteria for conducting Type I IEPR according to DCW Memorandum, Interim Guidance on Streamlining IEPR for Improved CW Product Delivery (5 April 2019) and EC 1165-2-217:

- *When the estimated total cost of the project, including mitigation costs, is greater than \$200 million.*
Based upon best available information and professional judgement, the estimated total project cost is assumed to be less than \$200 million.
- *When the Governor of an affected State requests a peer review by independent experts.*
There has not been a request for independent peer review by the Governor of California.
- *When the Chief of Engineers determines the project study is controversial due to significant public dispute over the size, nature, or effects of the project or the economic or environmental costs or benefits of the project.*
The project study has not been deemed controversial by the Chief of Engineers. The study/project is not likely to involve significant public dispute as to its size, nature, or effects of the project or its economic or environmental costs or benefits as improvements are proposed to an existing port/channel and the NEPA document being prepared for this study is an EA. The previous -50-foot project was not controversial, and this study/project is anticipated to be the same.

In addition to not meeting any of the mandatory triggers requiring IEPR, the project study also meets exclusion option “b” as provided by Section 2034 of WRDA 2007 and the DCW memorandum for streamlining IEPR:

- *Is for an activity for which there is ample experience within USACE and the industry to treat the activity as being routine.*
This project is for an activity (dredging and placement) for which there is ample experience within USACE and industry to be considered routine. There is little risk of any unique technical challenges arising in the design and implementation of this project.
- *Has minimal life safety risk*
The project will not be justified by life safety and does not involve significant threat to human life/safety assurance. There are no significant threats to human life associated with either construction of the proposed improvements, O&M of the proposed project, or with project failure.

- 2) **Decision on Type II IEPR.** Type II IEPR, Safety Assurance Review, is managed outside of the USACE and is performed on design and construction activities for any project where potential hazards pose a significant threat to human life. For Type II IEPRs, a panel is convened to review the design and construction activities before construction begins and periodically thereafter until construction activities are completed.

As documented in Section 5 of this RP, the PDT has assessed this single purpose DDN project and determined that it DOES NOT meet the criteria for conducting Type II IEPR:

- The Federal action is not justified by life safety and failure of the project will not pose a significant threat to human life.
- The project does not involve the use of innovative materials or techniques where the engineering is based on novel methods; it does not present complex challenges for interpretations; it does not contain precedent-setting methods or models; and it does not present conclusions that are likely to change prevailing practices. Proposed improvements are to an existing Federal navigation project. Construction and maintenance techniques have been standardized and no new techniques are expected to be utilized for design and construction activities.
- The project design does not require redundancy, resiliency, or robustness as the design of navigation improvements at the harbor will be based upon previously developed and utilized construction techniques which do not require redundancy, resiliency, and/or robustness.
- The project does not have unique construction sequencing or a reduced or overlapping design construction schedule.

F. Model Certification Or Approval

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models 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 use of a certified/approved planning model does not constitute technical review of a planning product. The selection and application of the model and the input and output data is the responsibility of the users and is subject to DQC, ATR, and IEPR.

The following planning models may be used to develop the decision document.

Table 5: Planning Models

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Certification / Approval Status
HarborSym 1.5.8.3 (Economics)	HarborSym is a discrete event Monte-Carlo simulation model designed to facilitate economic analyses of proposed navigation improvement projects in coastal harbors. Incorporating risk and uncertainty, the model will be used to estimate transportation cost savings (benefits) attributable to fleet and loading changes under future with project conditions.	Certified
Regional Economic System (RECONS) (Economics)	RECONS is a regional economic impact modeling tool that estimates jobs, income, and sales associated with Corps Civil Works spending and additional economic activities.	Certified

	The model will be used to estimate the regional economic impacts of project implementation.	
Habitat Evaluation Procedures (HEP) (Environmental)	HEP is a tool used by the USFWS to compare the environmental effects of alternatives and may be used during the preparation of the Coordination Act Report (to be determined in coordination with USFWS). The specific Habitat Suitability Indices (HSI) to be used in a HEP analysis, should such an analysis be conducted for the Coordination Act Report, have not been identified, but could include the Coho Salmon HSI. Should such be required, this RP will be updated, to identify any reviews required for compliance with model review guidance.	Approved

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. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR. The following models may be used to develop the decision document.

Table 6: Engineering Models

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Approval Status
SLOPE/W (Geotech)	SLOPE/W is a two-dimensional FEM (Finite Element Method) software used to analyze slope stability based on user's input of soil parameters	Allowed
Microcomputer Aided Cost Engineering System (MCACES), MII (Cost Engineering)	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
Cost Schedule Risk Analysis (CSRA) (Cost Engineering)	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 alternatives 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 risk will be performed using Crystal Ball CSRA.	CW Cost Engineering MCX mandatory
Total Project Cost Summary (TPCS) (Cost Engineering)	The TPCS is the required cost estimated document that will be submitted for either division or Headquarters, USACE (HQUSACE) 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 cost, construction schedules, construction contingencies, planning and	CW Cost Engineering MCX mandatory

	engineering costs, design contingencies, construction management costs, and management contingencies.	
Corps of Engineers Dredge Estimating Program (CEDEP) (Cost Engineering)	CEDEP is the required software program that will be used for dredging estimates using floating plants. CEDEP contains a narrative documenting reasons for decisions and sections made by the cost engineer. Software distribution is restricted as it is considered proprietary to the Government.	CW Cost Engineering MCX mandatory

G. Policy And Legal Compliance Reviews

In accordance with DPM CW 2018-05, P&LCRs for draft and final planning decision documents are delegated to the MSC responsible for the execution of the study.

With input from MSC and HQUSACE functional leaders and through collaboration with the Chief of Office of Water Project Review (OWPR), the MSC Chief of Planning and Policy is responsible for establishing a competent interdisciplinary P&LCR team (DPM 2019-01). The composition of the policy review team will be drawn from HQUSACE, the MSC, the Planning Center of Expertise (PCX), and other review resources as needed. The identification of Counsel Members will follow the procedures set forth by the HQUSACE Chief Counsel, as coordinated by HQUSACE and MSC Counsel functional leaders. The MSC Chief of Planning and Policy and the Chief of OWPR will collaborate to identify and endorse a P&LCR Manager from among the P&LCR team identified for the study. The manager may be a MSC, PCX, or HQUSACE employee. The team is identified in Attachment 1 of this RP.

The P&LCR team will:

- Provide advice and support to the PDT and decision makers at the District, MSC, HQUSACE, and Assistant Secretary of the Army for CW levels.
- Engage at both the MSC and HQUSACE levels, ensuring that the vertical teaming aspect of SMART planning is maintained.
- Help guide PDTs through project development and the completion of policy and legally compliant documents, identifying policy and legal issues as early as possible such that issues can be addressed while minimizing impacts to study and project costs and schedules.
- Provide impartial and unbiased recommendations, advice, and support to decision makers.

ATTACHMENT 1: TEAM ROSTERS

PROJECT DELIVERY TEAM			
Name	Position	Office	Phone Number
Erika E. Powell	Project Manager	SPN	415-793-1515
Karen Baumert	Lead Planner	NAN	917-790-8608
James Boyette	Project Scheduler	SPN	415-503-6565
Kerry Tam	Specialist	SPN	415-503-6737
Legese Abebe	Civil Engineering / Technical Manager	SPN	415-503-6933
Sherman Fong	Cost Engineering	SPN	415-503-6547
Ali Hajali	Cost Engineering	SPN	415-503-6826
Spencer Harper	Water Resources H&H	SPN	415-503-6743
Barney Wair	Geotechnical Engineering	SPN	415-215-1603
Andrew Bazzle	Economics	SAM	251-694-4101
Jennifer Purcell	Economics	SWF	817-886-1663
Sasha Voight	Economics	SPN	415-503-6953
Eric Joliffe	Environmental	SPN	415-503-6869
Kathleen Ungvarsky	Cultural Resources	SPN	415-503-6713
Keisha Salaam	Real Estate	SPN	415-503-6664
TBD	Office of Counsel	SPN	
Josh Miller	GIS Coordinator	SPN	415-503-6901
James Zoulas	Survey	SPN	415-289-3340

DISTRICT QUALITY CONTROL TEAM (subject to change based on team availability)			
Name	Position	Office	Phone Number
James Howells	Plan Formulator	SPN	415-503-6850
Janice Lera-Chan	Hydrology, Hydraulic, and Coastal (HH&C) Engineering, Climate Preparedness and Resilience	SPN	415-503-6743
Arthit Laikram	Civil/Design Engineering	SPN	415-503-6890
Tessa Beach	Environmental and Cultural Resources	SPN	415-503-6713
Ryan Taylor	Real Estate	SPK	916-557-6860
Jere Harper	Construction/Operations	SPN	415-289-3310
Julie McGuire	Economics	DDNPCX	251-690-2607
Bernard Wair	Geotechnical Engineering	SPN	415-503-6879
Warren Tan	Cost Engineering	SPN	415-503-6866

AGENCY TECHNICAL REVIEW TEAM			
Name	Position	Office	Phone Number
Rachel Mesko	ATR Lead	MVP	651-323-7178
TBD	Plan Formulation		
TBD	Economics (report)		
TBD	Economics (models)		
TBD	Environmental Resources		
TBD	Cultural Resources		
TBD	HH&C Engineer		
TBD	Geologist/Geotechnical Engineering		
TBD	Cost Engineering		
TBD	Construction/Operations		
TBD	Real Estate		
TBD	Climate Preparedness and Resilience CoP/HH&C Climate Reviewer		

VERTICAL TEAM			
Name	Position	Office	Phone Number
Jay Kinberger	Program Manager	SPD	415-503-6556
Josephine Axt	Chief of Planning and Policy	SPD	415-503-6590
Charles Wilson	Deputy Chief SPD RIT	HQUSACE	202-761-4085

POLICY AND LEGAL COMPLIANCE REVIEW TEAM			
Name	Position	Office	Phone Number
Kurt Keilman	Review Manager	SPD	415-503-6596
Kurt Keilman	Economics	SPD	415-503-6596
Jamie Higgins	Environmental	OWPR	202-963-8396
Michele Gomez	Plan Formulation	OWPR	202-761-7193
Micah Buchholz	Hydraulics and Hydrology	HQUSACE	202-761-7698
Patrick O'Brien	Climate Change	SWG	503-709-2177
Bonivee Delapaz	Real Estate	SPD	415-503-6745
Maryann Blouin	Office of Counsel	SPD	415-503-6634