

Attachment 3.Work Plan

INTRODUCTION

Goals and Objectives

The goal of the San Francisquito Creek Flood Protection and Ecosystem Restoration Capital Improvement Project, East Bayshore Road to San Francisco Bay is to provide protection against a 1% fluvial event coincident with a 1% tide, with accommodation for 26 inches of projected sea level rise and FEMA freeboard requirements on San Francisquito Creek between East Bayshore Road and the San Francisco Bay. The project will protect more than 1,100 properties from creek flooding, and when coupled with future tidal levee improvements, will remove these properties from the FEMA floodplain. The downstream reach of San Francisquito Creek between East Bayshore Road and San Francisco Bay is at the highest risk of severe flooding in the system, due to undersized channel capacity and sub-standard levees. Flooding risk is exacerbated during high tides. The creek in this area runs through communities that have experienced severe damage during previous flood events. The completion of the East Bayshore Road to San Francisco Bay reach is a necessary first step to provide comprehensive flood protection for the entire watershed and floodplain.

Protection for the approximately 5,500 properties in the San Francisquito Creek 100-year floodplain requires the completion of multiple projects both upstream and downstream of East Bayshore Road. This is one of several projects needed to reduce flooding throughout the watershed. Due to its complex nature, the project from the downstream face of East Bayshore Road to the San Francisco Bay, also referred to as the downstream project has been split into two phases. This grant application is requesting match funding for the Phase 1 project, described below.

The Phase 1 project includes elements along the lower two-thirds of the overall downstream project. The Phase 2 project in the upper one-third of the downstream project reach is in a more physically restrictive area, and is described in more detail at the end of this section. Of its own merit, the Phase 1 project would increase stream flow capacity from the downstream face of East Bayshore Road to the San Francisco Bay in several ways, reducing local flood risks during storm events by providing a portion of the capacity needed for upstream flood protection projects being planned by the San Francisquito Creek Joint Powers Authority (SFCJPA). Increasing San Francisquito Creek's flow capacity from Highway 101 to San Francisco Bay would be achieved by implementing several project elements. The Phase 1 project will include degrading a segment of the existing left levee (looking upstream) and constructing a setback levee further back on the City of Palo Alto Municipal Golf Course. An overflow terrace at a marsh elevation adjacent to this setback levee and along the entire low flow channel and Baylands Preserve will be constructed to provide additional habitat for identified species. Opposite this setback levee, the right levee will be rebuilt to appropriate geometric and compaction standards; stability problems will be addressed with all new levee construction. An un-maintained portion of the right levee downstream of Friendship Bridge will be removed to an elevation consistent with mean higher high water, so that flood flows above high tide stage from San Francisquito Creek will have the opportunity to split and flow naturally out into the Palo Alto Baylands Preserve as well as within the creek, toward the Bay. The existing outlet pipes and outfall structure at the O'Connor Street Pump Station will be modified to tie properly into the levee construction. An existing PG&E gas transmission line crossing under the creek will be relocated to minimize project area impacts. Discussions with PG&E are underway to redesign and relocate the gas transmission line.

Phase 1 consists of these project elements:

- Degrading un-maintained levee segments to allow for creek flow combined with more natural flow into the dendritic channels of the Palo Alto Baylands Preserve;
- Constructing a setback levee in order to address stability issues and widen the creek adjacent to the Palo Alto Municipal Golf Course;
- Constructing an overflow terrace at a marsh elevation along the setback levee and entire low flow channel to provide habitat for endangered species;
- Constructing a pedestrian boardwalk at Friendship Bridge providing recreational connectivity between the Cities of East Palo Alto and Palo Alto;
- Relocating PG&E's Gas Transmission Line to outside the project area;
- Constructing a tie-in of the O'Connor Street Pump Station outfall structure.

The Phase 1 project is at a 30% design level completion, and 60% design is near completion. The 30% PS&E reflect a project that is not yet split into Phase 1 and Phase 2. The phased project will be reflected in the 60% PS&E, currently underway.

The Phase 2 project, which is not part of this grant application, is the completion of design and construction of floodwalls where existing right-of-way is limited, including tie-ins at Highway 101 / East Bayshore Road and the San Francisquito Creek Pump Station, and coordination and relocation of existing utilities within the project area. While the completion of Phase 1 will allow a 100-year fluvial flow to be contained within the channel under existing conditions, the completion of Phase 2 will provide sufficient protection against SLR, and freeboard to remove parcels from the fluvial floodplain and allow work upstream.

Purpose and Need

San Francisquito Creek Flood Protection and Ecosystem Restoration Capital Improvement Project has recently been added to the Bay Area IRWM Plan, which is a component of the DWR's statewide IRWM Plan.

Projects selected to the Bay Area IRWMP are approved upon satisfying multiple requirements, such as the project is within the regional IRWM boundary and the project demonstrates benefits in multiple water resource management areas. San Francisquito Creek Phase 1 project satisfies both of the requirements.

The San Francisco Bay Area IRWMP identifies six regional goals:

1. Contribute to the promotion of economic, social and environmental sustainability
2. Contribute to improved supply reliability
3. Contribute to the protection and improvement of hydrologic function
4. Contribute to the protection and improvement of the quality of water resources
5. Contribute to the protection of public health, safety and property
6. Contribute to the creation, protection, enhancement and maintenance of environmental resources and habitats

The goals addressed by this Phase 1 project include:

	Bay Area IRWMP Goals					
	1	2	3	4	5	6
Place an "X" in the boxes corresponding to the numbered objectives above that the project addresses	X		X	X	X	X

The Phase 1 project addresses multiple Proposition 1E Water Management Strategies, such as ecosystem restoration, flood management, recreation and public access, wetland enhancement and watershed planning.

The Phase 1 project also provides Multiple Project Benefits, such as removal of invasive non-native species, the creation and enhancement of wetlands, and the acquisition, protection, and restoration of open space and watershed lands, planning and implementing multipurpose flood management programs, watershed protection and management, and ecosystem and fisheries restoration and protection.

Overall, the Phase 1 project will create new habitat and improve existing habitat by widening the channel to allow for the creation of new marsh wetlands, and opening the Creek to the Baylands Preserve will improve connectivity of the habitat areas. The Phase 1 project will create opportunities for recreational enhancements, such as improved public access, greater compliance with ADA standards, and additional marshland and wildlife viewing areas.

The Phase 1 project would increase stream flow capacity from the downstream face of East Bayshore Road to the San Francisco Bay. It will reduce local flood risks during storm events as well as provide a portion of the capacity needed for upstream flood protection projects being planned by the SFCJPA.

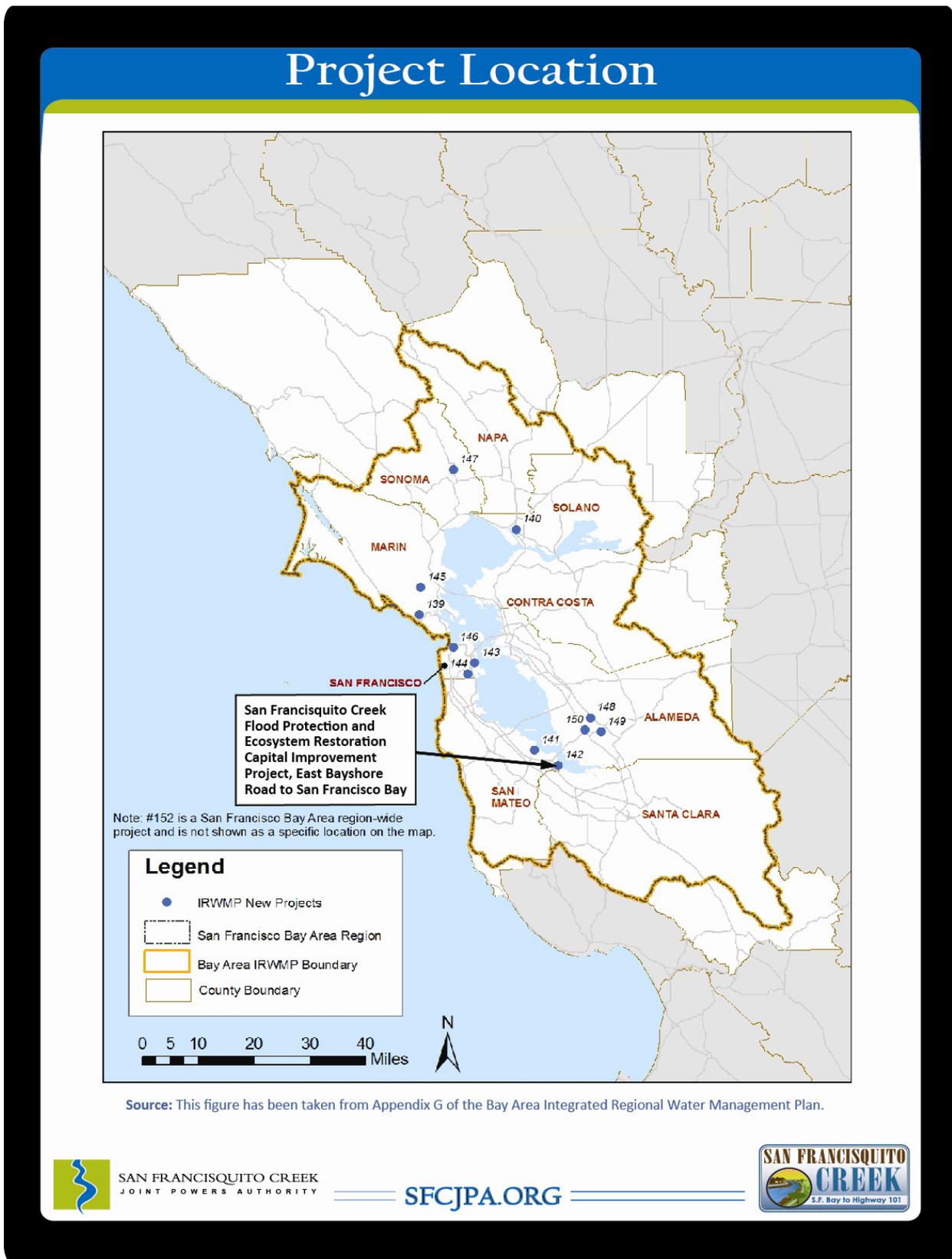
The Phase 1 project will remove fluvial flooding risks from San Francisquito Creek for over 1,000 properties (primary residences) within the City of East Palo Alto. The Median Household Income in East Palo Alto is \$44,000 annually, which is approximately 58% of the MHI for the State of California, qualifying East Palo Alto as a Disadvantaged Community as defined by the California Department of Finance Population Research Unit.

Project List

San Francisquito Creek Flood Protection and Ecosystem Restoration Capital Improvement Project, East Bayshore Road to San Francisco Bay – Faze 1

The completion of this project is not dependent upon any other projects. 30% design has been completed, 60% design is near completion. Other projects and phases of design and construction are dependent upon the completion of the Phase 1; however, Phase 1 is not dependent upon any other projects.

Regional Map



Completed Work

Santa Clara County (2006), LiDAR of San Francisquito Creek and surrounding areas. May. (Adjusted by HJW Geospatial in Sept. 2008 using Bestor Engineers TIN.)

Description: Bestor Engineers was hired by the USACE San Francisco District to provide mapping, for hydraulic modeling purposes, of San Francisquito Creek, from San Francisco Bay to approximately 10 miles upstream of the mouth. The survey included a detailed topographic survey of the creek channel using ground survey methods. A bathymetric survey was also performed along the creek channel between the mouth of the creek and the bridge at Highway 101. The bathymetric survey and conventional survey were merged, and were supplemented by an existing LiDAR set provided by the Santa Clara Valley Water District (SCVWD) in order to form a single continuous digital terrain model (DTM) of the entire San Francisquito Creek floodplain.

Philip Williams & Associates, Ltd. (2009), San Francisquito Creek Flood Reduction Alternatives Analysis, July 17, 2009

Description: SFCJPA selected the design alternative proposed by Philip Williams & Associates, Ltd. (PWA, dated July 2009), which includes channel geometry modification, floodwall installation, existing levee degrade, reconfiguration of a portion of the Palo Alto Golf Course, and an outlet structure for the proposed enlargement of the Highway 101/East Bayshore Road Bridge.

Santa Clara Valley Water District (2010 pending), Right of Way Study

Description: The study completed by the SCVWD, including linework and details for surrounding APNs, fee and easement.

Towill, Inc. (2010), San Francisquito Creek Mapping, DTM & Orthophotos, San Francisquito Creek from Highway 101 to SF Bay, March 2010

Description: Towill performed aerial mapping of the project area and Faber Tract in order to cover the entire project area downstream of East Bayshore Road, including the Palo Alto Baylands Preserve, and sufficient distance outside of the levee footprint. By compiling the previously mentioned surveys with this aerial mapping, the compiled survey provides planimetric detail sufficient for engineering design. Aerial photography was flown to support a scale of 1"=40', with 1 ft contours. Contours were generated from the Bestor DTM.

Design Services for Floodwater Conveyance Improvements on San Francisquito Creek from East Bayshore Road to San Francisco Bay, November 2009 - current

Description: HDR Engineering Inc. is under contract with the SFCJPA to provide consulting services in support of plans, specifications and estimates (PS&E) preparation for flood protection improvements along San Francisquito Creek between East Bayshore Road and the San Francisco Bay.

Scoped tasks include: project management; public outreach assistance; previous design concept, model, and base map/survey review; utility mapping; design criteria development; geotechnical investigations

and associated reporting and recommendations; PS&E at the 30%, 60%, 90% and 100% levels; and bid and construction support.

The 30% design package for the San Francisquito Creek Flood Protection Project from East Bayshore Road to SF Bay has been delivered and is comprised of the following documents:

- Technical Memorandum
- 30% Plan Set
- Technical Specifications Table of Contents
- Preliminary Estimate of Probable Construction Costs

Geotechnical Services, San Francisquito Creek Flood Protection Capital Project, San Mateo and Santa Clara Counties, CA, November 2009

Description: GEI Consultants are under contract with the SFCJPA to provide consulting services in support of geotechnical data gathering and review, design review, field work, laboratory testing, analyses, evaluations, and recommendations, and report documentation.

Existing Data and Studies

USACE San Francisco District (2005), San Francisquito Creek Flood Damage Reduction & Ecosystem Restoration General Investigations Program, 905(b) Analysis Reconnaissance Study. March 14, 2005

Description: This document describes the flooding and water resources related problems and opportunities associated with San Francisquito Creek; determine whether there is Federal Interest for flood control improvements; and identifies a non-Federal sponsor willing to share the cost of a detailed Feasibility Study of alternative plans for flood damage reduction and ecosystem restoration.

USACE San Francisco District (2005), San Francisquito Creek Flood Damage Reduction & Ecosystem Restoration General Investigations Program, San Mateo & Santa Clara Counties, CA, Proposed Feasibility Phase Project Management Plan. September 27, 2005

Description: This Project Management Plan (PMP) outlines the study approach and methodology for the San Francisquito Creek Feasibility Study. The PMP presents the scopes of work, schedules, and budgets for the technical support.

Wang et al (2007), Santa Clara Valley Water District, San FrancisquitoCreek Hydrology Report. December 2007

Description: This report summarizes the work completed on the San Francisquito Creek hydrology. Presented in this report are recommended design flows for San Francisquito Creek and its respective tributaries.

Noble Consultants, Inc. (2009), Final Report, San Francisquito Creek, Development and Calibration/Verification of Hydraulic Model. May 26, 2009

Description: Hydraulic report summarizes development and calibration/verification of the hydraulic HEC-RAS model developed for San Francisquito Creek.

Light, Air & Space Construction Environmental Services Company (2009), San Francisquito Creek Hazardous Toxic Radioactive Waste Study, San Francisco Bay to Searsville Dam Plus Additional 5-Square Mile Study Area, Santa Clara and San Mateo Counties, California. November 20, 2009

Description: This report summarizes the environmental evaluation and results.

USACE San Francisco District (2009), Appendix C, DRAFT Geotechnical Appendix and Reliability Analysis of Downstream Floodwalls and Levees, San Francisquito Creek, F3 Milestone Without Project, December 2009

Description: This report describes the geologic setting, seismicity and anticipated geotechnical performance of the levees and floodwalls in the study area.

GEI Consultants (2010), Data Gathering and Review Technical Memorandum, San Francisquito Creek Flood Protection Project, January 19, 2010

Description: This memo provides documentation of the Data Gathering and Review and Geotechnical Design Review efforts completed by GEI Consultants.

U.S. Army Corps Engineers, San Francisco District (2010), Draft Without Project Conditions Coincident Frequency Analysis, San Francisquito Creek, San Mateo and Santa Clara Counties, CA, Ma 2010

Description: This report summarizes the results of a coincident frequency analysis evaluation for San Francisquito Creek.

HDR Engineering, Inc. (2010), Draft Design Criteria and Considerations Technical Memorandum, San Francisquito Creek Flood Protection Capital Project. June 11, 2010

Description: This document summarizes the design criteria and considerations that will guide development of PS&E for the flood conveyance improvement of San Francisquito Creek between East Bayshore Road and the San Francisco Bay based upon the selected alternative design.

HDR Engineering, Inc. (2010), Draft Hydraulic Review Technical Memorandum, San Francisquito Creek Flood Protection Capital Project. August 3, 2010

Description: This document summarizes the review findings of the existing hydraulic HEC-RAS model for the downstream portion of San Francisquito Creek between East Bayshore Road to the San Francisco Bay. This review consisted of confirming the model's compatibility with the selected conceptual level design, and recommending adjustments to the hydraulic model to be consistent with the proposed construction plans.

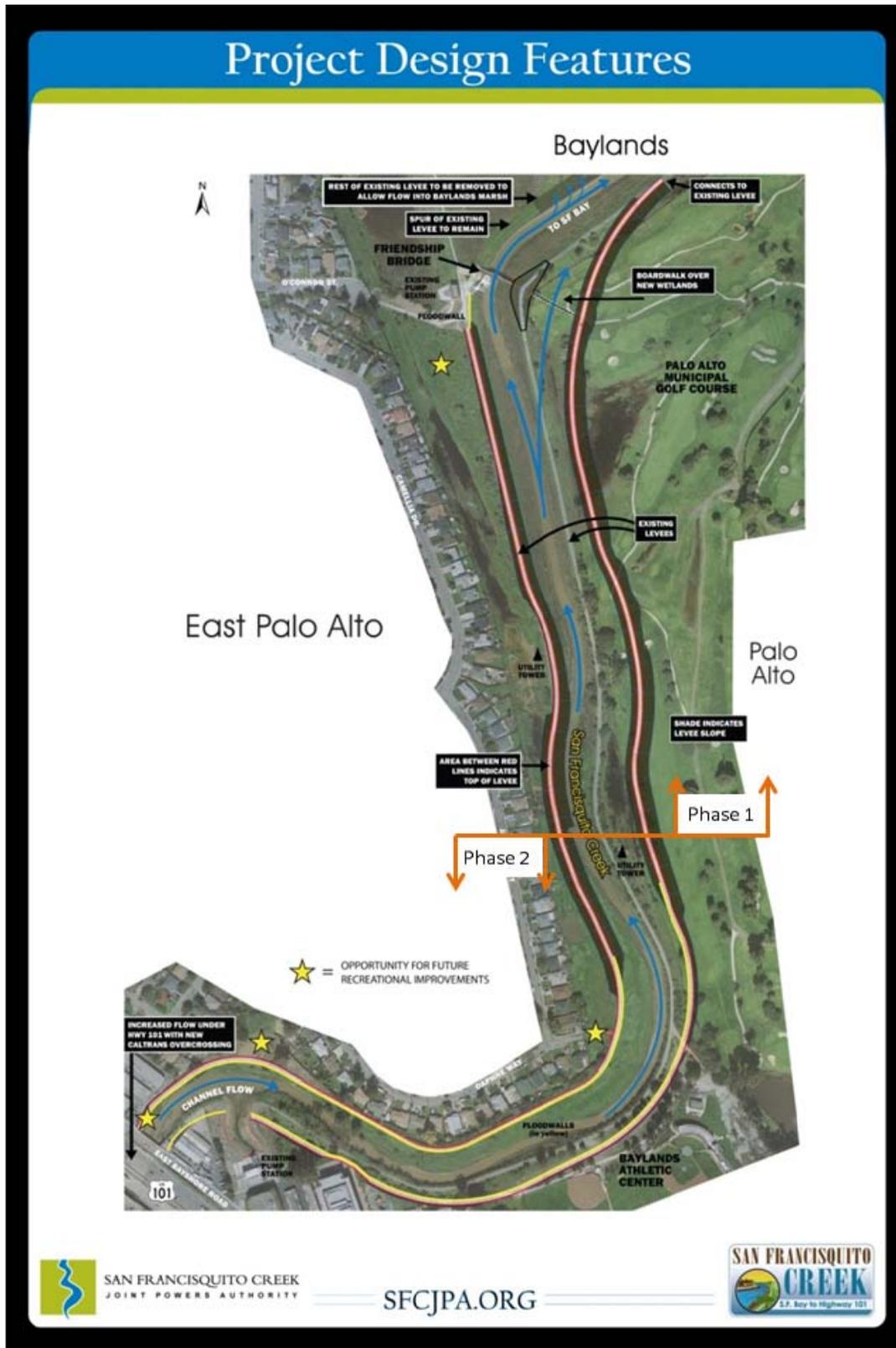
HDR Engineering, Inc. (2010), 30 Percent Design Technical Memorandum, San Francisquito Creek Flood Protection Capital Project. August 3, 2010

Description: This document summarizes the design analysis at the 30% design stage, as well as modifications made to the project since the release of the Alternatives Analysis.

HDR Engineering, Inc. (2010), Faber Tract Hydraulic Impacts Technical Memorandum, San Francisquito Creek Flood Protection Capital Project. October 8, 2010

Description: This document summarizes the hydraulic analysis completed for impacts to the Faber Tract (Baylands Preserve) based upon the planned levee degrade between San Francisquito Creek and the Baylands Preserve.

Project Map



Project Specifics

Project	Site Specific Geographic Location	Project's Function with Relation to other stormwater or sewage conveyance systems
Phase 1	Within the Bay Area IRWM region (see included figure of the Bay Area IRWM region)	The Phase 1 project is a necessary first step to provide comprehensive flood protection along San Francisquito Creek. The project will improve creek flow capacity independent of and prior to the construction of upstream projects.

Project Timing and Phasing

The commencement and completion of this project is not dependent upon any other projects. Phase 1 is being designed to provide for lowered water surface elevation within the Creek channel throughout the project reach as compared to existing conditions during any combination of fluvial and tidal events. Phase 2 of the Project is intended to provide FEMA freeboard for the upstream portion of the project reach. Projects being planned for the Highway 101 crossing and stream reaches upstream of 101 are intended to provide benefits for other portions of the floodplain, and are not needed for, nor will they enable benefits to be realized by Phase 1 of the East Bayshore Road to SF Bay Project.

TASKS

The following pages describe the Work Plan setting forth various tasks using the outline suggested on the Proposition 1E Proposal Solicitation Package.

Task 1: Administration

SFCJPA staff will manage the project with respect to schedule, budget, compliance, coordination, and outreach activities. The SFCJPA will manage and support development of all deliverables required for project implementation and ensure appropriate quality standards are met. The SFCJPA will resource, through interagency participation or consultant utilization, all tasks required for project implementation.

Management of the project will be conducted by the following assigned staff members:

- 1.1 –Project Manager**
- 1.2 –Executive Director**
- 1.3 –Finance Manager**
- 1.4 –Legal Counsel**

Deliverables

- Deliverables for the Project Management task will include regular SFCJPA Board briefings, as described in Subtask 3.4.

Task 2: Labor Compliance Program

All work completed will be compliant with the California Code of Regulations labor compliance programs. Construction contracts will be compliant with Davis-Bacon wage determinations.

Task 3: Reporting

Subtask 3.1 - Design Progress Report

The design team will participate in monthly meetings with the SFCJPA to discuss progress and issues that may affect completion of design, plans, and specifications. The design team will provide an agenda one week prior to the meetings, as well as draft and final meeting minutes of each meeting to the SFCJPA.

Subtask 3.2 - Environmental Progress Report

The environmental compliance team will participate in monthly meetings with the SFCJPA to discuss project progress and issues that may affect environmental compliance, mitigation, permitting or schedule. The environmental compliance team will provide an agenda one week prior to the meetings, as well as draft and final meeting minutes of each meeting to the SFCJPA.

Subtask 3.3 - Construction Progress Report

The construction management team will participate in monthly meetings with the SFCJPA to discuss project progress and issues that may affect construction cost and schedule. The construction management team will provide an agenda one week prior to the meetings, as well as draft and final meeting minutes of each meeting to the SFCJPA.

Subtask 3.4 - SFCJPA Board Briefings

SFCJPA staff will provide regular briefings to inform the SFCJPA Board on the progress of design, environmental, and construction activities.

Deliverables

- The SFCJPA will provide the final Design Progress Reports to DWR.
- The SFCJPA will provide the final Environmental Progress Reports to DWR.
- The SFCJPA will provide the final Construction Progress Reports to DWR.
- The SFCJPA will provide SFCJPA Board Briefing materials (agenda, minutes, reports) to DWR.

Task 4: Land Acquisition

A real estate plan will be developed that establishes the approach for the identification, appraisal, and acquisition of real estate interests in support of construction and associated environmental mitigation. The Real Estate Plan will address the acquisition schedule and resolve issues identified in association with encroachments, relocations, or replacement as well as questions concerning the appropriate real estate interest associated with specific features. The Real Estate Plan will describe the existing land use

and ownership, potential encroachments, tract register, and real estate take map. The Real Estate Plan will be at a level of detail commensurate with identified lands requirements.

Subtask 4.1 –Agreement with City of Palo Alto

All of the land that will need to be acquired for Phase 1 is owned by the City of Palo and is designated as park land, and a formal agreement for the use of this land is being developed.

Deliverables

- Draft and Final Real Estate Plan

Task 5: Assessment and Evaluation

In 2002, the SFCJPA began seeking federal authorization of a U.S. Army Corps of Engineers (Corps) General Investigation (GI) “New Start” to develop a comprehensive plan for providing flood management, ecosystem enhancements, and recreational opportunities along San Francisquito Creek. In 2004, the Corps received federal authorization to conduct, in partnership with the SFCJPA, a watershed-wide Flood Damage Reduction and Ecosystem Restoration Project (FDRER) General Investigation. Federal funding for the FDRER is issued on an annual basis through insertion of the item in either a House or Senate appropriations bill and passage of the federal budget. Over the past six years, federal funding has been inconsistent and inadequate to address the flood protection needs of local residents.

In 2008, the SFCJPA also began to reexamine the possibility of implementing local capital projects by applying through Section 104 of the Water Resources Development Act for future federal credit against the reduction in costs to the overall project (without damaging the GI’s cost-benefit ratio). The capital project alternatives contemplated for implementation through the Section 104 program were considered for their ability to meet the SFCJPA’s goals to reduce flooding, protect the environment, and provide recreational opportunities without adversely affecting communities in other parts of the watershed and within certain budget constraints. A field of 26 original project alternatives was narrowed to 4 candidate alternatives through evaluation against a set of criteria developed by the SFCJPA’s Technical Advisory Committee.

Subtask 5.1 – Conceptual Design

In early 2009, the SFCJPA hired a hydrologic consultant firm to conduct a preliminary technical analysis on the remaining candidate alternatives to determine feasibility, hydraulic performance, and develop preliminary cost estimates of a preferred alternative. The Final Report from this effort is available at: <http://www.cityofpaloalto.org/knowzone/news/details.asp?NewsID=1344&TargetID=215>

The project alternative recommended by the SFCJPA Executive Director and accepted by the SFCJPA Board of Directors on July 23, 2009 would widen the mainstem channel of San Francisquito Creek between the downstream face of East Bayshore Road, a highway frontage road connected to U.S. 101, and San Francisco Bay. This reach of San Francisquito Creek has the lowest conveyance capacity of any stream reach within the watershed’s primary floodplain, and is at highest risk of severe flooding from fluvial and tidal sources. Additionally, as determined by the preliminary technical analysis and other

hydraulic modeling performed by the SFCJPA Technical Advisory Committee and independent stakeholders, improving conveyance capacity within this stream reach will facilitate future projects to increase floodwater conveyance in reaches of San Francisquito Creek upstream of the project site by providing capacity to pass flow levels greater than those that could reach the project site under current conditions.

There are a number of factors that make this section of the creek the top priority of the SFCJPA's flood management efforts:

- It is at highest risk of severe flooding from two sources: 1) flows coming down from the hills and 2) tidal surges from the bay.
- It runs through communities that have experienced damage and dislocation during previous flood events, such as the floods of 1998.
- It is a necessary first step to providing full and comprehensive flood protection, as upstream flow improvements (such as removal of bridge constrictions) cannot be implemented until downstream capacity has been increased.
- Lowering the water surface elevation at the downstream reach will improve drainage upstream, even before upstream projects are built.

The SFCJPA is in the process of completing design and environmental documentation for the preferred alternative, and is seeking Proposition 1E funding to implement Phase 1 of the Project.

Deliverables

- No additional assessments or evaluations are anticipated to complete design and construction.

Task 6: Final Design

Subtask 6.1 - 60 Percent Design

Plans, Specifications and Estimates

Design will proceed to the 60% level, during which comments received on the 30% design will be incorporated. Responses to these comments will be documented; any non-concur responses will be resolved with the SFCJPA prior to completion of the task. The 60 percent submittal will include a full set of drawings, draft technical specifications and Special Provisions, quantities, and an estimate of probable construction cost. Final detailed survey topography and survey control will be included.

Storm Water Pollution Prevention Plan (SWPPP)

A Storm Water Pollution Prevention Plan (SWPPP) Report that includes during-construction and post-construction erosion control and pollution prevention methods will be developed. The SWPPP Report will include a description of interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Site plans will show that existing vegetation is preserved where possible and that disturbed portions of the site are stabilized. Use of impervious surfaces for stabilization will be avoided.

Deliverables

- 60 Percent Design Plan and Specifications
- Design Calculations
- Responses to 30 Percent Comments
- Technical Memorandum
- Design Calculations, Quantities & Preliminary Estimate of Probable Construction Cost
- SWPPP Report

Subtask 6.2 - 90 Percent Design

Plans, Specifications and Estimates

Design will proceed to the 90 percent level, during which comments received on the 60 Percent design will be incorporated and responses documented. The 90 Percent submittal will include a full set of drawings, draft specifications, quantities, and an estimate of probable construction cost. Final detailed survey topography and survey control will be included.

Storm Water Pollution Prevention Plan (SWPPP)

A preliminary SWPPP will be developed based on the previously submitted SWPPP and in accordance with the California Stormwater Quality Association's (CASQA's) *Construction Best Management Practices Handbook*. This deliverable will include a site map and details suitable for use in the final SWPPP satisfy requirement of the **2009 Draft National Pollution Discharge Elimination System (NPDES) Construction General Permit**.

Tasks will include:

- Evaluating existing data regarding soil and runoff quality.
- Developing a plan to disturb the smallest area possible and avoid sensitive areas.
- Listing potential pollution sources in construction area.
- Listing all soil-disturbing activities.
- Preparing a pollution prevention site map that delineates surface waters, steep slopes, areas of soil disturbance, and post construction storm water discharge locations.
- Selecting BMPs for the site.

Deliverables

- 90 Percent Design Plan and Specifications
- Responses to 60 Percent Comments
- Design Calculations, Quantities & Preliminary Estimate of Probable Construction Cost
- Preliminary SWPPP Report

Subtask 6.3 - 100% Design

Design will proceed to the 100 percent level, during which comments received on the 90 percent design will be incorporated and responses documented. The 100 percent submittal will include a full set of

drawings, technical specifications and special provisions, quantities, and a final estimate of probable construction cost.

Storm Water Pollution Prevention Plan (SWPPP)

Based on necessary, collected site-specific information, including grading and/or drainage plans, the Notice of Intent (NOI) will be developed for the subject site in accordance with California Regional Water Quality Control Board guidelines (NPDES General Permit for Storm Water Discharges Associated With Construction Activity, Water Quality Order 99-08-DWQ) and recommendations to address identification of applicable, effective stormwater and non-stormwater BMPs and schedule of implementation for use during and after construction. Tasks will include:

- Evaluating existing data regarding soil and runoff quality
- Developing a plan to disturb the smallest area possible and avoid sensitive areas
- Listing potential pollution sources in construction area
- Listing all soil-disturbing activities
- Preparing a pollution prevention site map that delineates surface waters, steep slopes, areas of soil disturbance, and post construction storm water discharge locations
- Selecting best management practices (BMPs) for the site.

Deliverables

- 100 Percent Design Plans and Specifications, stamped by a registered professional
- Quantities & Final Estimate of Probable Construction Cost, stamped by a registered professional
- Electronic AutoCAD files of the plan set
- Responses to and final resolution of 90 percent Comments
- Project Status Report (including project contacts, memos to RE, utility agreements, permits, right-of-way contracts, report copies)
- Notice of Intent in accordance with State NPDES General Permit
- Surveyor's file

Subtask 6.4 - Operation and Maintenance Plan

An Operation and Maintenance (O&M) plan will be developed in accordance with industry standards and relevant USACE guidelines as well as FEMA criteria as described in 44 CFR 65.10. The Santa Clara Valley Water District and the City of East Palo Alto, the agencies responsible for maintenance of the new levees in Santa Clara and San Mateo Counties, respectively, will be consulted during development of the O&M plan to ensure responsibilities and requirements are understood and agreed upon.

Deliverables

- Draft and Final Operations and Maintenance Plan

Task 7: Environmental Documentation

Based on a preliminary review performed by the SFCJPA, the following environmental resources could be affected by construction of the Project.

- Visual resources
- Traffic flow
- Recreation
- Ambient noise
- Air quality
- Biological resources
- Cultural and paleontological resources
- Water quality

Because of the potential for significant impacts on the environment, as the lead agency responsible for compliance with the California Environmental Quality Act (CEQA), the SFCJPA has decided to prepare an environmental impact report (EIR) to provide ample opportunity for public disclosure and public participation in the planning and decision making process.

Subtask 7.1 – Draft EIR

In September 2010, the SFCJPA published a notice of preparation (NOP) to initiate the CEQA scoping process through which the SFCJPA will refine the range of issues and Project alternatives to be addressed in a draft EIR. The draft EIR will analyze the topic areas identified above in detail, and any others for which potentially significant impacts are identified, and will propose measures to mitigate (avoid, reduce, or compensate) for any impacts evaluated as significant.

Public Scoping Meetings were held on September 29 and September 30, 2010, in East Palo Alto and Palo Alto to gather input from the public on the proposed project design.

Subtask 7.2–Final EIR

It is anticipated that the Draft EIR for the project will be released in August 2011. Upon circulation and incorporation of comments to the Draft EIR, it is anticipated that the Final EIR will be adopted by the SFCJPA Board of Directors in February 2012.

Deliverables

- Draft EIR
- Final EIR

Task 8: Permitting

Subtask 8.1 – Permit Acquisition

Design and Investigation Requirements

The design and environmental compliance teams will coordinate to identify, avoid, and minimize potential impacts to existing resources associated with any required geotechnical borings, and to prepare and submit permits required for these activities.

Based on the review of the project alternatives, it is anticipated that geotechnical investigations may occur in areas subject to jurisdiction of the USACE under Section 404 of the Clean Water Act (CWA), and that these activities could be authorized under Permit 6 (Survey Activities) and Nationwide Permit 33 (Temporary Construction, Access, and Dewatering) of the Nationwide Permit Program (NWP). NWPs are subject to compliance with other federal and state laws including Section 401 of the CWA, the federal Endangered Species Act (ESA), and Section 106 of the National Historic Preservation Act. Compliance with these laws and regulations will require preparation of a preconstruction notification (PCN) and a water quality certification application for compliance with Sections 401 and 404 of the CWA, and a biological assessment for Section 7 consultation under the federal ESA. The investigations will also require preparation of a Notification of a Lake or Streambed Alteration Agreement for compliance with Section 1602 of the California Fish and Game (CFG) Code.

Project and Construction Requirements

The project will adhere to the following regulations and policies.

- Clean Water Act Sections 303, 401, 402, and 404—The Clean Water Act (CWA) is the primary statute that regulates water quality impacts. CWA. Section 303 requires the State to establish beneficial uses of state waters and to adopt water quality standards to protect those uses, Section 401 regulates the discharge of pollutants into waters of the United States, Section 402 regulates construction-related stormwater discharge to surface waters, and Section 404 regulates the placement of dredged and fill materials into jurisdictional waters of the United States,” includes oceans, bays, rivers, streams, lakes, ponds, and wetlands.
- California Fish and Game Code Section 1602 (Streambed Alteration Agreement)—Section 1602 of the Fish and Game Code regulates projects that would affect the flow, channel, or banks of rivers, streams, and lakes. It requires public agencies and individuals to enter into a Streambed Alteration Agreement imposing specific commitments to avoid habitat damage if a project would divert, obstruct, or change the natural flow of the streambed or use streambed materials.
- Rivers and Harbors Act Section 10—Rivers and Harbors Act Section 10 regulates construction in and over navigable waters of the United States, requiring proponents to obtain a permit from the U.S. Army Corps of Engineers for the construction of structures such as bridges, causeways, dams, and dikes; the excavation/dredging or deposition of material in these waters; or any obstruction or alteration of navigable waters.

- California State Wetlands Conservation Policy—The California State Wetlands Conservation Policy of “no net loss” is consistent with the U.S. Army Corps of Engineers’ policies governing habitat mitigation commitments for issuance of permits under CWA Section 404.
- McAteer-Petris Act—The McAteer-Petris Act authorizes the jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC) over tidally influenced waters within a 100-foot buffer of the Bay. For the proposed project, jurisdiction of the BCDC begins at the pedestrian footbridge, approximately 5,000 feet downstream of the US-101 bridge.
- U.S. Army Corps of Engineers (Corps, USACE) levee design guidelines and levee vegetation guidelines.

The project will obtain authorization under the following regulations, and will accordingly incorporate associated permit terms and mitigation requirements.

- Clean Water Act Sections 404 and 401–402.
- California Fish and Game Code Section 1602 (Streambed Alteration Agreement).
- Rivers and Harbors Act Section 10.
- McAteer-Petris Act (BCDC permit)

Upon completion of 60% Design P&S, the SFCJPA’s environmental consultant on the project will begin preparation of permit applications for required authorizations. Pre-consultations with several of the permitting authorities have either taken place or are schedule for Spring of 2011.

Additionally, the SFCJPA wishes to obtain FEMA certification for the project once all phases are completed, therefore project levees will comply not only with Corps levee design guidelines but also with the recently issued guidance regarding levee vegetation (ETL 1110-2-571). Although the vegetation guidance has created significant concerns among resource agencies and others, the SFCJPA has determined that because the new levees will be constructed in an area dominated by marshplain grasses and low marsh semi-aquatic vegetation, that compliance with ETL 1110-2-571 will not compromise the benefits of the intended restoration components of the project.

Deliverables

- Preconstruction Notification for Sections 401/404 of CWA
- Water Quality Certification application for Sections 401/404 of CWA
- Biological Assessment for Section 7 under ESA
- Notification of Lake or Streambed Alteration Agreement for Section 1602 of CFG code
- Application for Rivers and Harbors Act (Section 10 permit)
- Application for McAteer-Petris Act (BDCP permit)

Task 9: Construction Contracting

Subtask 9.1 Bid Solicitation

This task includes all pre-award activities including preparation of bid package, advertising and notice to contractors, holding a pre-bid conference, responding to requests for clarification on bid documents, and issuing revised bid documents.

Subtask 9.2 Bid Evaluation

This task includes bid compliance check and evaluation. The bids will be reviewed to ensure they are complete, have been signed by the proper authority, bonds are valid, and required documentation is enclosed. SFCJPA staff will complete evaluation of responsive and compliant bids with member agency assistance.

Subtask 9.3 Contractor Selection/Contract Execution

This task includes activities required to bring the winning bidder under contract for the Project. Following determination of the winning bid, a letter of intent will be sent to the winning bidder, notifying them of the award and requesting acknowledgement and willingness to enter into contract negotiation.

Deliverables

- Minutes from pre-bid conference
- Addendum to bid documents
- Clarifications to bid documents
- Bid Evaluation Summary
- Negotiated/Awarded Contract

Task 10: Construction

Subtask 10.1 Mobilization and Site Preparation

Mobilization

This task will consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; and for all other work and operations which must be performed before beginning work at the project site. The contractor will establish temporary facilities and areas, and install temporary fencing. The construction work area will be inspected to identify possible environmental constraints, terrain limitations and other interferences. The contractor will meet with local agencies and organizations, as required, to ensure site operations are conducted in a manner consistent with local requirements and contract documents.

Site Preparation

This task will consist of clearing vegetation and debris from the immediate work areas. Clearing and grubbing will consist of removing unwanted materials from the work area including trees, stumps, roots, brush, downed timber and rubbish (as applicable). Debris and cleared materials will be consolidated and stockpiled at a designated disposal area. Following clearing activities along the project site and work area, erosion, water, and pollution control measures will be installed. Layout surveying will be completed and construction alignments will be identified from established control points, benchmarks, and baselines indicated on the design drawings.

Subtask 10.2 Project Construction

The following elements of the Project will be constructed:

- Relocate PG&E gas transmission line
- Degrade existing left bank levee
- Construct new left bank set back levee
- Construct left bank overflow terrace
- Degrade and reconstruct right bank levee
- Degrade right bank levee downstream of Friendship Bridge
- Construct O'Connor Street Pump Station outfall modifications and tie-in
- Construct pedestrian boardwalk at Friendship Bridge

Subtask 10.3 Performance Testing and Demobilization

Performance Testing

All gates and valves will be tested during this phase to ensure proper working condition. Testing will be performed at design head to ensure there are no leaks or malfunctions in use. Mechanical operation will be verified prior to project close-out.

Demobilization

Demobilization will include all activities for transportation of personnel, equipment, and supplies not required or included in the contract from the site, including disassembly, removal and site cleanup, of offices, buildings and other facilities assembled on the site specifically for the project.

Task 11: Mitigation Activities

Environmental compliance and mitigation work for all project impacts associated with construction or any other project activities that may cause temporary disruptions to the project area will be described in the Draft EIR scheduled for public release in August 2011, as described in Task 7.

Permanent impacts to the landscape and operation of businesses and facilities in the Phase 1 reach will be limited to lands owned and operated by the City of Palo Alto. The following properties are expected to experience long-range impacts:

- 1) The Palo Alto Baylands Preserve
- 2) The Palo Alto Municipal Golf Course
- 3) Palo Alto Baylands Athletic Center

All of these properties are designated as city park land and are preserved as such; a re-designation of these lands for other uses can come only by a vote of the people of the City of Palo Alto. The City has indicated that per their land-use ordinances, implementation of the project would not require a re-designation of the existing land use type. Therefore, permanent impacts will be limited to the areas on which new project features (levees) will encroach on to lands currently used by these park facilities.

Subtask 11.1 – Palo Alto Baylands Preserve

It is not anticipated that Phase 1 will induce any long-term negative impacts on the Preserve. Impacts will be limited to the periodic introduction of fresh creek water to the marshplain environment of the Faber Tract, the parcel within the Baylands Preserve located directly to the north of the downstream most reach of the creek channel. This periodic freshwater action on the Faber Tract simulates a return to historic conditions, and will likely have some beneficial impacts for native species that utilize the area. Future projects (projects planned at US 101 and upstream) that will result in increased flow levels reaching the project area during extreme events could create significant negative impacts on the levees surrounding the Faber Tract, as an increase in fluvial contributions is anticipated to lead to increased water surface elevations under certain conditions (as evidenced by recent hydraulic modeling). Mitigations for these impacts will be planned as appropriate during the design and environmental planning of those upstream projects.

Subtask 11.2 – Palo Alto Municipal Golf Course

Permanent impacts to the Golf Course landscape and operations will result from the realignment of the left levee (looking upstream) throughout the Phase 1 reach on to portions of land currently used for golf. The SFCJPA, in partnership with the City of Palo Alto, is developing plans to reconfigure several holes on the golf course to accommodate the Project, while maintaining the Golf Course's overall length and play rating. Preliminary analysis indicates that six holes will need to be modified to accommodate the encroachment of the new levee – relocation of the tee box will be need for two holes; new greens will need to be constructed for two separate holes; and new fairway alignments, including relocation of several trees and irrigation lines will be needed for an additional two holes. Preliminary estimates indicate that design and construction can be completed on the golf course within a six to eight month window. The golf course design, when complete, will be evaluated in the project EIR.

Subtask 11.3 – Baylands Athletic Center

Most of the permanent impacts on the Baylands Athletic Center will be realized during the construction of Phase 2 of the project, which will encroach on to a compacted gravel area currently used as overflow parking for the ball fields at the Center. The SFCJPA and its design consultant are developing a plan with the City of Palo Alto to best accommodate the City's long term parking needs at this facility, and will

implement the appropriate mitigations as part of Phase 2. Significant temporary impacts will be realized at the Athletic Center, as the Athletic Center parking lot will be used as the primary access and staging area for construction activities. The SFCJPA and its design consultant are developing a vehicle and pedestrian routing plan to mitigate for these temporary disruptions.

Task 12: Construction Administration

Subtask 12.1 - Construction Management

This task includes all activities required to manage the construction phase of the project. Activities carried under this task include:

- Conducting the pre-construction conference
- Monitoring the Contractor's performance and enforcing all requirements of applicable codes, specifications, and the contract drawings.
- Performing field inspection and other quality control activities including necessary materials testing.
- Monitoring construction schedules throughout the course of construction.
- Reviewing working days, contract time and documenting time extensions.
- Maintaining a daily inspector's report system that records the hours worked by staff and equipment. The narrative portion of the report will include a description of the contractor's operation and location of work and any other pertinent information.
- Tracking subcontractor's work, and ensuring the contractor submits written requests prior to substituting a contractor.
- Maintaining well-organized photographic/video records during construction.
- Ensuring the contractor properly provides for the safety of the workers.
- Managing change orders and obtaining required local agency approval.
- Managing submittals and monitoring the designer's review activities.
- Managing claims.
- Managing the contractor's Requests for Information (RFI).
- Reviewing and recommending progress payments.
- Determining materials sampling, testing requirements and providing acceptance testing services.
- Enforcing labor compliance (Task 2) by preparing daily reports with required information, monitoring certified payrolls and doing spot check labor surveys and interviews.
- Supervising contractors traffic plan, as necessary
- Establishing a punch list system.
- Establishing a record file that supports 1) adequacy of field control, 2) conformance to contract specifications, 3) payments to contractor. The file must be complete, organized and maintained in a manner that permits inspection by the local agency.

Subtask 12.2 – Engineering Services during Construction

The SFCJPA’s designer shall assist the SFCJPA and SFCJPA’s Construction Manager during the construction phase of the project. This support will include the following activities:

- Attendance at and assistance during the pre-construction conference
- Attendance at resolution meetings
- Assist the SFCJPA in providing responses to RFI, preparation of change orders (review the validity of the request and assist SFCJPA in its response), and letters of clarification regarding interpretation of plans and specifications
- Perform shop drawing and submittal reviews
- The designer shall conduct periodic field visits to observe progress and as requested by SFCJPA. The designer shall also attend periodic site meetings between SFCJPA and the Contractor.
- Provide recommendations for changes required by design discrepancies, utility conflicts, or due to other issues which may arise during construction
- Perform a final walk-through inspection when construction is complete

Subtask 12.3 - Record Documents

Should any changes to the construction documents take place during the construction phase, these changes would be captured in the record drawings. Based on change orders and field revisions to the construction drawings, the SFCJPA will compile record drawings of the constructed improvements for each bid package. The Record Documents will conform to the marked-up prints, drawings and other data furnished to the SFCJPA by the Contractor. This set of Record Documents shall show the reported location of the work and significant changes made during the construction process.

Deliverables

- Construction meeting agenda and minutes
- RFI Response
- Letters of Clarification
- Shop Drawings and Submittal Reviews
- Change Orders
- Final construction report including all project documentation.
- Record Drawings

OTHER

Coordination Procedures

The SFCJPA is the sole applicant for Prop 1E funding for the project. As such, it is anticipated that the SFCJPA will administer all grant funds, and will allocate payments to third parties in accordance with the procedures established in the grant agreement with the State of California. Should it be necessary or advantageous for grant monies to be distributed directly to one of the SFCJPA’s project partners, such as one or more of the SFCJPA member agencies, the SFCJPA shall enter in to a Memorandum of Understanding with the project partner for the pass through of funds via the SFCJPA grant agreement,

or forfeit the portion of the grant award commensurate with the task(s) to be performed by the partner agency to be dispersed through a separate agreement between that project partner and the State of California, as directed by DWR.

Standards

Levee Design Criteria

Criteria that will be applied to the design of flood protection improvements for this project will be based on published Federal and State guidelines and design standards, included in the following regulations:

- Code of Federal Regulations (CFR), Title 44, Volume 1, Chapter I, Section 65.10 (44CFR65.10)
- California Code of Regulations (CCR) Title 23

While Title 23 is specific to California's Central Valley, applicable standards of practice will be referenced from this document wherever practicable. It is also recommended to adhere to applicable USACE and DWR guidelines for the design of flood protection systems. While the CFR and CCR reference several USACE publications, there are several additional documents that provide standards and guidance for analyses and practices relevant to levee construction and maintenance.

For levees to be accredited by FEMA, they must be certified by a licensed professional engineer or a Federal agency responsible for their design. Certification is a finding that, with reasonable assurance, sufficient data exists that the system in question provides protection from the 100-year flood event. These requirements are outlined in 44 CFR 65.10. The USACE and DWR criteria will be followed for the design of levees based on the requirements of 44 CFR 65.10 as well as recent publications not cited in 44 CFR 65.10. This includes design criteria for levee geometry, seepage, slope stability, and levee settlement. Additionally, requirements for freeboard, closure structures, embankment erosion protection, interior drainage, and the requirements for an O&M plan are addressed in 44 CFR 65.10.

The most recent USACE published documents, including Engineer Manuals (EM), Engineer Regulations (ER), Engineer Circulars (EC) and Engineer Technical Letters (ETL), will be the basis for the design criteria.

General Levee Cross-Sectional Geometry

USACE EM 1110-2-1913, Design and Construction of Levees (USACE 2000), was consulted for determining the minimum levee geometry. Based on this document, the following levee section will be used for levee design:

- Minimum levee crown width of 16 ft (USACE requires a minimum 12 ft crown for minor tributaries, but discussions with stakeholders and SFCJPA member agencies have resulted in a wider crown for maintenance and inspection activities). Narrower crown widths may be required based on right-of-way limitations, on a case-by-case basis.
- Landside slope 2H:1V or flatter.
- Levee waterside slope 3H:1V or flatter.

Levee Fill Material

EM 1110-2-1913 does not provide specific requirements for levee fill material. Based on the available geotechnical data, previous experience and industry standard practice, the following material types are recommended:

- Levee Embankment Fill
- Liquid Limit (LL) is less than or equal to 45
- Plasticity Index (PI) is greater than or equal to 8 and is less than or equal to 40
- Fines content (Passing no. 200 sieve) is greater than or equal to 20%
- Seepage Berm and General Purpose Fill (Random Fill)
- All suitable borrow material

The maximum particle size for all material types is 2 inches. These criteria may be updated if the potential borrow sources include material with higher plasticity, which can be placed within the inner core of the levee cross section to maximize usage of borrow material and on site excavations.

Levee embankment material is recommended to be compacted to 97% of the maximum density per American Society of Testing and Materials (ASTM) D 698, with a moisture content between -1 and +3% of optimum. Seepage Berm Fill is recommended to be compacted 90% of the maximum density per ASTM D 698, with a moisture content between -1 and +3% of optimum.

Underseepage and Through Seepage

Levee embankment stability can be compromised if hydraulic exit gradients caused by relatively high underseepage pressures exceed allowable values. Excessive hydraulic exit gradients can result in the formation of sand boils, piping, and levee failure if left unrepaired. Similarly, seepage through the levee embankment can result in seepage breakouts on the landside levee slope and reduce levee slope stability.

The following USACE publications are used to evaluate underseepage and through seepage for the project levee:

- EM 1110-2-1913, Design and Construction of Levees (USACE 2000)
- ETL 1110-2-569, Design Guidance for Levee Underseepage (USACE 2005)
- EM 1110-2-1901, Seepage Analysis and Control for Dams (USACE 1993)
- EM 1110-2-1908, Instrumentation of Embankment Dams and Levees (USACE 1995)
- EM 1110-2-1914, Design, Construction and Maintenance of Relief Wells (USACE 1992)

Based on these publications, the average hydraulic exit gradients must be equal to or less than the following values for a water level at the design WSE:

- | | |
|--|-----|
| • Landside levee toe | 0.5 |
| • Toe of seepage berm | 0.8 |
| • Landside levee toe with seepage berm | 0.5 |
| • Bottom of empty ditch at landside toe | 0.5 |
| • Bottom of empty ditch 150 ft or more from landside toe | 0.8 |

- For ditches between the landside toe and 150 ft from the landside toe, linearly interpolate between 0.5 and 0.8

The average exit gradients summarized above are based on the assumption that the saturated unit weights of the “in situ” landside blanket soils and seepage berm (if present) must be at or above 112 pounds per cubic foot. If the saturated unit weight of the landside blanket soils is less than 112 pounds per cubic foot, the exit gradient would be reduced to achieve the required minimum factor of safety (FS). The minimum FS at the levee toe is 1.6 and the minimum FS at the toe of the seepage berm is 1.0.

Previous experience and guidance from the USACE suggests that the maximum allowable exit gradient should be lowered to 0.3 at critical locations such as pump stations, sumps, swimming pools, areas difficult to flood fight and areas with insufficient subsurface information.

In addition to the criteria outlined above for the design WSE, DWR has published draft criteria for levees in urban and urbanizing areas. These criteria are included in the Draft Proposed Interim Levee Design Criteria for Urban and Urbanizing Area State-Federal Project Levees, Third Draft (DWR 2009). These criteria are similar to the criteria above with respect to design WSE loading, but include an additional condition of a free water surface at the hydraulic top of levee (HTOL) on the water side of the levee. The HTOL is defined as the lowest of the following elevations:

- The expected water surface elevation plus a minimum of 3 feet
- The physical top of levee (or the water surface profile that matches the physical top of the levee at its lowest point) if interim criteria are met, or
- The expected 500-year water surface elevation.
- For the HTOL loading condition, the maximum allowable gradient at the toe of the levee is 0.6 (FS of 1.3) and at the toe of the seepage berm is 0.9 (FS of 0.9).

Static Slope Stability

Design criteria applicable to slope stability are as follows:

- EM 1110-2-1913, Design and Construction of Levees (USACE 2000)
- EM 1110-2-1902, Slope Stability (USACE 2003)

The required minimum slope stability Factor of Safety (FS) presented in EM 1110-2-1913 are:

- End of Construction 1.3
- Steady State 1.4
- Rapid Drawdown 1.0 to 1.2 (only applicable to waterside slope)

For the HTOL loading condition, the minimum steady state FS is 1.2.

Earthquake Loading

The following documents serve as design criteria for earthquake (seismic) loading:

- EM 1110-2-1913, Design and Construction of Levees (USACE 2000)

- ER 1110-2-1806, Earthquake Design and Evaluation for Civil Works Projects (USACE 1995)

In regards to earthquake loading, EM 1110-2-1913 states the following:

“Earthquake loadings are not normally considered in analyzing the stability of levees because of the low probability of earthquake coinciding with periods of high water. Levees constructed of loose cohesionless materials or founded on loose cohesionless materials are particularly susceptible to failure due to liquefaction during earthquakes. Depending on the severity of the expected earthquake and the importance of the levee, seismic analyses to determine liquefaction susceptibility may be required.”

Although there is a relatively low probability of an earthquake occurring simultaneously with the design WSE, the time required to repair the levee after the seismic event needs to be considered.

Furthermore, ER 1110-2-1806 states “Appropriate methods should be used to analyze the liquefaction and/or estimate deformities for embankment (dams, dikes, levees that retain pools), slope and foundation materials when subjected to ground motions corresponding to the Maximum Design Earthquake (MDE) and the Operating Basis Earthquake (OBE).”

Therefore, liquefaction and associated foundation and/or embankment deformities should be evaluated with the following minimum factors of safety:

- Liquefaction Hazard 1.0
- Post-earthquake slope stability 1.0

Levee Settlement

Foundation settlement due to levee construction should be accounted for when establishing the top of levee (TOL) elevation. The levee design TOL should be increased to account for the calculated post-construction consolidation settlement. Preliminary values were assumed for planning purposes based on the selected levee cross sections. Areas to include a floodwall were assumed to have a settlement value of 0 feet. Where the existing levee would be raised a value of 0.5 feet was assumed, and for areas where a new levee would be constructed on a previously untested foundation a value of 1.0 foot was used.

Penetrations and Encroachments

Penetrations and encroachments into the levee prism are generally not recommended, although in discussions with the USACE San Francisco District, reviewers may be more lenient with those located in the freeboard area, i.e. within the three feet of minimum additional height above the design WSE. The levee prism is defined as a cross-sectional shape with a top elevation equal to the design TOL and slope projections that extend downward no steeper than 3H:1V on the waterside and 2H:1V on the landside.

Pipes and Conduits

All existing pipes and conduits beneath the levee prism or within 10 ft of the toe of the levee will be removed and relocated as necessary to meet the following criteria:

- Pressure pipes/conduits crossing beneath the levee crown must be above the 100-year design water surface elevation and outside of the landside and waterside slope of the levee prism. These pipes must be equipped with a positive cutoff valve waterside of the levee crown.
- The following documents shall be referenced in design:
- EM 1110-2-2705, Structural Design of Closure Structures for Local Flood Control Protection Projects (USACE 1994)
- EM 1110-2-2902, Conduits, Culverts and Pipes (Change 1) (USACE 1998)

Utility Poles/Towers and Supports

The location of utility poles and supports that interfere with the proposed levee construction must be approved by the SFCJPA if they are to remain in place. In general, utility pole foundations are not allowed to penetrate the levee prism, per USACE levee encroachment guidelines. Utility tower or pole foundations will be located outside of the levee prism unless approved by the SFCJPA and coordinated with the USACE San Francisco District and the utility in question for acceptability. If tower foundations or other encroachments must remain in the levee prism, seepage must be reduced to acceptable levels, and their location must not interfere with normal or flood-fighting maintenance and operations. Coordination with the appropriate utility will be required to ensure towers that are left within the channel are modified as required for the design flow.

The following document shall be referenced:

- ER 1110-2-100, Periodic Inspection and Continuing Evaluation of Completed Civil Works Structures (USACE 1995)
- Levee Vegetation:
- Design criteria for vegetation management in the project area shall be found in:
- ETL 1110-2-571, Guidelines for Landscape Planting and Vegetation Management at Levee, Floodwalls, Embankment Dams, and Appurtenant Structures (USACE 2009)

As required by the USACE, a “vegetation free zone” must be retained on and adjacent to levees and floodwalls, with the exception of certain grass species, for erosion control. The purpose of this zone is to provide access for inspection, maintenance, monitoring and flood-fighting. The vegetation-free-zone contains the levee crown, the side slopes and a 15-foot setback from the landside and waterside toes. For floodwalls, special consideration must also be given to the distance between large trees and the wall, and the potential for damage by root systems.

The SFCJPA intends to pursue a variance from the aforementioned criteria through the USACE. Should a variance be granted, alterations to the design criteria will be made accordingly.

Structural Design Criteria

Floodwalls

The following documents will be used to form the basis for floodwall design:

- EM 1110-2-2502, Retaining and Flood Walls (USACE 1989)
- EM 1110-2-2100, Stability Analysis of Concrete Structures (USACE 2005)

- USACE EM 1110-2-2104, Strength Design for Reinforced Concrete Hydraulic Structures (Change 1) (USACE 2003)
- EM 1110-2-2105, Design of Hydraulic Steel Structures (Change 1) (USACE 1994)
- EM 1110-2-2504, Design of Sheet Pile Walls (USACE 1994)
- EM 1110-2-2906, Design of Pile Foundations (USACE 1991)

Appurtenant Structures

For any additional structural components, or when supplemental design criteria is appropriate, the following documents shall be referenced:

- ASCE/SEI 7-05, Minimum Design Loads for Buildings and Other Structures, (American Society of Civil Engineers 2005)
- ACI 318-08, Building Code Requirements for Structural Concrete and Commentary, (American Concrete Institute, 2008)

Performance Measures and Monitoring Plans

Phase 1 project will comply with all performance measures and monitoring requirements laid out within 44 CFR Section 65.10. Please also see *Attachment 6: Monitoring, Assessments, and Performance Measures*.

Land Acquisition

The lands impacted by the Phase 1 project are either owned by the City of Palo Alto, Santa Clara Valley Water District, or the City of East Palo Alto, all of which are Member Agencies of the SFCJPA and participating in project planning. The Phase 1 project concept has been specifically conceived to restrict residential property impacts, and rely on municipal lands only.

Building Materials

Levee Fill Material

Levee fill material should have a plasticity index of at least 8% and less than 25%, a liquid limit less than 45%, and 100 percent of the material passing the 2-inch sieve, and at least 20 percent passing the number 200 sieve. Levee fill material should be placed in maximum uncompacted lifts of 8-inches and moisture conditioned to between -1 and +3 percent of optimum moisture content. The fill should be compacted to a minimum dry density of 97% of the maximum laboratory dry density determined by ASTM Method D698.

Geogrid Product

Additional reinforcement of the levee foundation will be required. Foundation reinforcement such as biaxial polyester geogrid product (HueskerFortracGeogrid 80 MP, or equivalent) should be used.

Concrete Design Mixes

Mix proportions for each concrete class shall be determined and tested as follows:

Requirement	Test Method	Number of Tests
Specific gravity absorption of fine aggregate	ASTM C 128	As required for the concrete aggregate for each trial mix
Specific gravity and absorption of coarse aggregate	ASTM C 127	
Gradation of fines and coarse aggregates	ASTM C 117 and ASTM C 136	
Dry-rodded unit weight of coarse aggregate	ASTM C 29/C 29 M	
Trial mixes using at least three different water/cement ratios, minimum allowable slump; both with and without air entrainment	ACI 211.1	As required to determine the concrete mix having the properties specified for each concrete class
Making and curing concrete specimens	ASTM C 192/C 192M	Two sets of three specimens for each design mix
Sampling fresh concrete in the laboratory	ASTM C 192/C 192M	One for each set of design mix specimens
Slump	ASTM C 143 / C 143M	
Air content	ASTM C 231	
Yield	ASTM C 138/ C 138M	
Compressive Strength	ASTM C 39/ C 39M	Three specimens tested at 7 days, and three specimens tested at 28 days for each mix design

Timber deck, combo timber and rebar/metal railings, likely concrete pier columns.

SLOPE/W software

Software by GEO_SLOPE International, Ltd to conduct levee slope stability analyses.

Permits

The project will adhere to the following regulations and policies:

- Clean Water Act Sections 303, 401,402, and 404—The Clean Water Act (CWA) is the primary statute that regulates water quality impacts. CWA. Section 303 requires the State to establish beneficial uses of state waters and to adopt water quality standards to protect those uses, Section 401 regulates the discharge of pollutants into waters of the United States, Section 402 regulates construction-related stormwater discharge to surface waters, and Section 404 regulates the placement of dredged and fill materials into jurisdictional waters of the United States,” includes oceans, bays, rivers, streams, lakes, ponds, and wetlands.

- California Fish and Game Code Section 1602 (Streambed Alteration Agreement)—Section 1602 of the Fish and Game Code regulates projects that would affect the flow, channel, or banks of rivers, streams, and lakes. It requires public agencies and individuals to enter into a Streambed Alteration Agreement imposing specific commitments to avoid habitat damage if a project would divert, obstruct, or change the natural flow of the streambed or use streambed materials.
- Rivers and Harbors Act Section 10—Rivers and Harbors Act Section 10 regulates construction in and over navigable waters of the United States, requiring proponents to obtain a permit from the U.S. Army Corps of Engineers for the construction of structures such as bridges, causeways, dams, and dikes; the excavation/dredging or deposition of material in these waters; or any obstruction or alteration of navigable waters.
- California State Wetlands Conservation Policy—The California State Wetlands Conservation Policy of “no net loss” is consistent with the U.S. Army Corps of Engineers’ policies governing habitat mitigation commitments for issuance of permits under CWA Section 404.
- McAtteer-Petris Act—The McAtteer-Petris Act authorizes the jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC) over tidally influenced waters within a 100-foot buffer of the Bay. For the proposed project, jurisdiction of the BCDC begins at the pedestrian footbridge, approximately 5,000 feet downstream of the US-101 bridge.
- U.S. Army Corps of Engineers (Corps, USACE) levee design guidelines and levee vegetation guidelines.

The project will obtain authorization under the following regulations, and will accordingly incorporate and associated permit terms and mitigation requirements.

- Clean Water Act Sections 404 and 401–402.
- California Fish and Game Code Section 1602 (Streambed Alteration Agreement).
- Rivers and Harbors Act Section 10.
- McAtteer-Petris Act (BCDC permit)

Upon completion of 60% Design P&S, the SFCJPA’s environmental consultant on the project will begin preparation of permit applications for required authorizations. Pre-consultations with several of the permitting authorities have either taken place or are schedule for Spring of 2011.

Additionally, the SFCJPA wishes to obtain FEMA certification for the project once all phases are completed, therefore project levees will comply not only with Corps levee design guidelines but also with the recently issued guidance regarding levee vegetation (ETL 1110-2-571). Although the vegetation guidance has created significant concerns among resource agencies and others, the SFCJPA has determined that because the new levees in Phase 1 will be constructed in an area dominated by marshplain grasses and low marsh semi-aquatic vegetation, that compliance with ETL 1110-2-571 will not compromise the benefits of the intended restoration components of the project. A variance to these guidelines will likely be sought for Phase 2 of the Project.

CEQA/NEPA

A Notice of Preparation of an Environmental Impact Report has been published, and CEQA scoping meetings were held on 9/29/10 and 9/30/10 in East Palo Alto and Palo Alto, respectively. A consultant has been retained by the SFCJPA and has already conducted several studies intended to ascertain potential impacts. Required documentation will be secured in early 2012.

GWMP

A GWMP is not required for this project. See *Attachment 1: Authorization and Eligibility Requirements*.

Deliverables to DWR

DWR will be kept apprised of the project status by Design, Environmental, Construction Progress Reports submitted on a monthly basis and SFCJPA Board Briefing minutes.

Most Recent Plans and Specifications

30% Submittal, dated August 3, 2010