SAN FRANCISQUITO CREEK
JOINT POWERS AUTHORITY

SFCJPA.ORG

July 31, 2014

Mr. Bruce Wolfe
Executive Officer
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: Revised Application Package for Section 401 Water Quality Certification for the San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project San Francisco Bay to U.S. Highway 101

Dear Mr. Wolfe:

The San Francisquito Creek Joint Powers Authority (SFCJPA) is pleased to submit a Revised Clean Water Act Section 401 Water Quality Certification (Certification) Application Package for the San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project, San Francisco Bay to U.S. Highway 101 (Project).

This Revised Application to the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) incorporates by reference all of the materials previously submitted by the SFCJPA in its Original Certification Application Package (CIWQS Place No. 757384) that was denied without prejudice on February 27, 2014, and it describes changes to the Project requested by the Regional Water Board and another regulatory agency since that date.

This Project will provide 100-year creek flood protection to thousands of residents and business owners, during an extreme tide occurring with over two feet of Sea Level Rise in an area subject to Bay tidal flooding. Severe flooding due to the creek occurred at the Project site in 1998, and as recently as December 2012 homes here were flooded as water overtopped and seeped through the uncertified levee. We are pleased that you previously have recognized the urgency and independent utility of this Project, and agree that it should not be delayed as various agencies and landowners discuss potential projects in other parts of the watershed that are far off in the future. We are also pleased that, after reviewing many alternatives to the Project, you decided to move forward with the Project described in this Application. Your desire to act on this Application now allows us to more quickly reduce the risk to life and property facing residents of East Palo Alto and other communities adjacent to the creek. Among additional benefits, the Project will improve the quality of water reaching the Bay because stormwater will flow over a new habitat-rich marsh channel rather than over streets and through homes, garages and offices; and the Project enables PG&E to construct a new, safer gas transmission line farther from East Palo Alto homes.

Application History to Date

The Original Certification Application Package was submitted by the SFCJPA to the Regional Water Board on March 12, 2013. The Regional Water Board issued a Letter of Incomplete for the application on March 29, 2013, and received supplemental application materials on August 1, 2013. On September 4, 2013, the Regional Water Board notified the SFCJPA that the application was complete, but that additional information was necessary to complete Certification. Concerns over salt marsh species impacts and the potential for increased stormwater discharge into the Faber Tract marsh (located just north of the creek) prompted the SFCJPA to modify the Project design, which resulted in an additional submittal on January 28, 2014.

In addition to these submittals, SFCJPA staff and consultants met with Regional Water Board staff on August 29, September 18, November 7, and December 12, 2013; and February 3 and February 11, 2014. As mentioned, on February 27, 2014, the Regional Water Board issued its denial without prejudice and invited the SFCJPA to reapply.

Since late February there have been several meetings of SFCJPA staff and consultants with Regional Water Board and other regulatory agency staff that have resulted in additional design modifications. Following an exhaustive analysis of these modifications and other alternatives, on July 11, 2014 you indicated to the SFCJPA and others that we had successfully demonstrated that the Project is the Least Environmentally Damaging Practicable Alternative to meet our flood protection objectives, and you invited the SFCJPA to reapply for Certification. On July 24, 2014, you sent me a letter requesting information so that the Regional Water Board can expeditiously act on the new application. This application package includes a response to your July 24 letter, new and revised application materials, and references to materials from the Original Application that are applicable to the Project.

Revised Project Design

In response to comments from regulatory agencies, the SFCJPA has modified the Project in three substantive ways over the past five months. We will now:

1. Reduce Rock Slope Protection (RSP) by converting 1.6 acres of RSP into vegetative levee protection;
2. Improve the stability of the levee separating the creek from Faber Tract marsh by filling an eroded low spot in that levee;
3. Degrade a levee on the north side of the creek that separates it from San Francisco Bay.

These three items constitute all of the changes to the Project design since your February 27, 2014 denial without prejudice of the Original Certification Application Package. These changes are described in the attached documents, which constitute our Revised Application Package.

Summary of Project Impacts and Mitigation

The Project will result in 8.3 acres of permanent impacts and 3.1 acres temporary impacts, for a total of 11.4 acres of impacts, primarily to low-quality habitat areas that are considered waters of the state. The Project would create approximately 13.6 acres of higher-quality tidal marsh, effectively restoring tidal influence in the Project reach. After levee construction is complete, the tidal marsh area would be terraced and revegetated with high-marsh plants. The high-marsh planting area would total 5.9 acres and the high-marsh transition planting area would total 7.7 acres. Additional vegetative areas will be created with the installation of vegetated shrub bands across the RSP area and vegetative levee protection to provide refugia and promote long-term vegetated protection and stability.

Application Package contents, including new documents and revised documents that were previously submitted in the Original Application Package

Changes to the Project design following the February 27, 2014 letter have resulted in the need to submit a revised 401 Water Quality Certification Application Package. The following is a list of application materials being submitted as part of this package, including a note as to whether the item is revised or new:

1. 401 Certification Application Form (Form R2C502-E) – REVISED
2. 401 Certification Application, Additional Pages - REVISED
3. An Erratum that presents revisions made to 401 Certification Application Package – NEW
4. Response to your July 24, 2014 letter requesting project information for the Certification Application Package - NEW

5. Appendix A: Figures - REVISED
6. Appendix B: Fee Calculator Spreadsheet - REVISED
7. Appendix C: HDR Design Documentation Report and associated Design Plans - REVISED
8. Appendix D: HDR Hydraulic Study Report – REVISED
9. Appendix E: Mitigation and Monitoring Plan – REVISED
10. Appendix F: Project Operations and Maintenance Plan - NEW
11. Appendix G: Rapid Permit Assessment Checklist – NEW
12. Appendix H: Additional Supporting Documents – NEW
13. Appendix I: Copy of Revised Application for Section 404 Individual Permit (In Preparation)
14. Appendix J: Copy of Revised Notification of Streambed Alteration (In Preparation)

Items previously submitted that have not changed and are thus not included in this Package

The following items that were previously submitted (on March 12, 2013, August 1, 2013, or January 28, 2014), remain unchanged or are no longer applicable, and therefore will not be included in this submittal:

- Representative Photographs
- Environmental Impact Report (EIR) Notice of Preparation
- Final EIR
- EIR Notice of Determination
- EIR Statement of Overriding Considerations
- Biological and Essential Fish Habitat Assessment
- Preliminary Delineation of Wetlands and Other Waters of the United States
- 95% Plan Set with Cross Sections
- 95% Plan Set Boardwalk Sheets
- Erosion Protection Analysis and Design Report
- San Francisquito Creek Flood Reduction Alternatives Analysis
- Temporary Water Diversion Plan and Santa Clara Valley Water District's Best Management Practices Handbook
- Diversion Plan
- Letter re: Palo Alto Airport
- LOI Response Letters 1 and 2 (submitted on August 1, 2013 and January 28, 2014, respectively)

If you or your staff have any questions regarding this Application Package, please contact SFCJPA Project Manager Kevin Murray at kmurray@sfcjpa.org or 650-324-1972. Thank you for your efforts to complete the permit process on this urgent project for our communities.

Sincerely,

Len Materman
Executive Director

STATE OF CALIFORNIA – CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD
1515 CLAY STREET, SUITE 1400
OAKLAND, CALIFORNIA 94612

APPLICATION FOR 401 WATER QUALITY CERTIFICATION AND/OR REPORT OF WASTE DISCHARGE

(FORM R2C502-E)

1. APPLICANT'S NAME	4. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
San Francisquito Creek Joint Powers Authority, Kevin Murray	Alexa La Plante, Icf International
2. APPLICANT'S ADDRESS	**5. AGENT'S ADDRESS**
615 B Menlo Avenue Menlo Park, Ca 94025	620 Folsom Street, Suite 200 San Francisco, Ca 94107
3. APPLICANT'S PHONE & FAX NOS. (email optional)	**6. AGENT'S PHONE & FAX NOS.** (email optional)
650.324.1972	415.677.7118

7. STATEMENT OF AUTHORIZATION

I hereby authorize N/A to act on my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT'S SIGNATURE **DATE**
(This must be signed by the Applicant, not the authorized agent)

PROJECT OR ACTIVITY INFORMATION

8. PROJECT NAME OR TITLE (See Instructions.)
San Francisquito Creek Flood Reduction, Ecosystem Restoration, And Recreation Project, San Francisco Bay To Hwy 101

9. NAME OF AFFECTED WATERBODY(IES) (See instructions.)	10. PROJECT STREET ADDRESS (if applicable)
San Francisquito Creek, South San Francisco Bay, Faber Tract And Associated Unnamed Sloughs	See Box 13

11. LOCATION OF PROJECT

San Mateo	Palo Alto	Region 2 – San Francisco Bay
COUNTY	**CITY/TOWN (or unincorporated)**	**REGIONAL WATER BOARD REGION**

12. OTHER LOCATION DESCRIPTIONS (watershed, latitude & longitude, river mile, etc. Attach map. See instructions.)
San Francisquito Creek Watershed, 200 feet upstream of East Bayshore and Highway 101 Bridge to San Francisco Bay. See the Additional Pages; Box 12: Project Location, for more details.

13. DIRECTIONS TO THE SITE

From Highway 101 North: Take the Embarcadero Road exit. Keep left at the fork and follow signs for Embarcadero Road. Then, keep right at the fork and follow signs for Embarcadero Road East and merge onto Embarcadero Road. Take a left onto Geng Road and follow to the end of the road.

From Highway 101 South: Take the Embarcadero Road/Oregon Expressway. Keep left at the fork and follow signs for Embarcadero Road East, then merge on Embarcadero Road. Take a left onto Geng Road and follow to the end of the road.

14. PROJECT PURPOSE (Describe the reason or purpose for the overall project. See instructions.)

The Project would improve channel capacity for Creek flows coupled with the influence of the tides of San Francisco Bay, including projected Sea Level Rise (SLR), from the downstream face of East Bayshore Road to San Francisco Bay. It would reduce local fluvial flood risks in the action area during storm events, provide the capacity needed for future upstream improvements, increase and improve ecological habitat, and provide for improved recreational opportunities

15. DESCRIPTION OF ACTIVITY AND ENVIRONMENTAL IMPACTS (Provide a full, technically accurate description of the entire activity and associated environmental impacts. See instructions.)

The San Francisquito Creek Joint Powers Authority (SFCPJA) proposes the San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project San Francisco Bay to Highway 101 (Project). This Project would increase conveyance and retention capacity of floodwaters from runoff and San Francisco Bay tides to protect residents and property from flood events along the lower section of the Creek, from East Bayshore Road to the San Francisco Bay. An Environmental Impact Report was approved October 25, 2012 . Work within the project boundary includes the following activities:

• Excavating sediment deposits within the channel to maximize conveyance.

• Rebuilding levees and relocating the southern levee to widen the channel to reduce influence of tides and increase channel capacity.

• Constructing floodwalls in the upper reach to increase capacity and maintain consistency with Caltrans' enlargement of the U.S. 101/East Bayshore Road Bridge over San Francisquito Creek (Caltrans facility). See Additional Pages; Box 15: Description of Activity and Environmental Impacts, for full details.

• Raising and grading a portion of the currently unmaintained levee between the Creek and the Faber Tract closer to its original design elevation to stabilize the levee and reduce storm water flows to the Faber Tract marsh;

• Degrading of a section of the levee north of the creek and east of Faber Tract to restore the creek-Bay interface to a marsh area east of Faber Tract and to reduce water surface elevations in the creek between Friendship Bridge and the Bay.

See Additional Pages: Box 15: Description of Activity and Environmental Impacts, for full details.

16. AVOIDANCE OF IMPACTS (Describe efforts to avoid and minimize impacts to waters of the State. See instructions.)

See Additional Pages: Box 16: Avodiance of Impacts which details the measures that will be implemented as necessary to reduce and minimize stormwater pollution during ground disturbing maintenance activities.

17. ENVIRONMENTAL DOCUMENTS (list any non-CEQA environmental documents that have been prepared for the project and/or the project site. Provide the date of the document and the name of the individual, firm, or agency that prepared it. Provide a copy of delineations and endangered species surveys. See instructions.)

Biological and Essentiual Fish Habitat Assessment, IFC International, November 2012, Compact Disc 2

Preliminary Delineation of Wetland and Other Waters of the United States, ICF International, June 2012, Compact Disc 2

SWPPP, in preparation

DREDGE & FILL INFORMATION

18. The following items must be completed for each action where fill or other material will be temporarily (T) or permanently (P) discharged to a wetland or other waterbody, and where material will be dredged from a waterway (add additional pages as necessary). Provide a map showing the location of each action (See instructions):

Map Location Number	LOCATION (show on plan & indicate waterbody)	REASON FOR ACTION (See instructions)	AMOUNT AND TYPE OF MATERIAL (in cubic yards, see instructions)	SURFACE AREA OF FILL (in acres and/or linear feet; specify **(T)** or **(P)**; see instructions)
	See Additional Pages: Box 18: Dredge and Fill Information			

MITIGATION

19. MITIGATION (Describe the size, type, and functions, and values of the proposed mitigation. Describe success criteria, monitoring, and long-term funding, management, and protection of the mitigation site. Attach a Mitigation Plan if needed. See instructions and contact Regional Board staff for additional assistance.)

The SFCJPA is restoring affected tidal marsh, diked marsh, freshwater marsh, and riparian habitat with the proposed enlarged tidal marshplain that would represent a combination of in-kind and out-of-kind mitigation for habitat impacts (see Figure 2). As the restored marshplain will provide habitat of higher quality than is being impacted (including appropriateness to the site, species composition, potential use by sensitive species and contiguous area), the Project proposes that the impacted 11.44 acres of habitat is fully compensated by the 13.59 acres of restored marshplain.

In-kind restoration options don't exist in the study area if the ultimate goal is to retain the natural functions and values of San Francisquito Creek. Much of the impacted waters are small patches of diked marsh, primarily within the Golf Course, that does not offer much ecological benefit beyond that of the disturbed open space and Golf Course that surrounds it and a freshwater pond and associated freshwater marsh in the Golf Course that represent low-quality habitat for sensitive species . Out-of-kind restoration will occur on-site, and will result in a greater net acreage of continuous habitat creation than in-kind, off-site restoration and result in an overall net benefit to the ecosystem. The SFCJPA has included a Mitigation and Monitoring Plan (MMP) (Appendix E) to ensure that all removed habitat is replaced with native marshplain species to maintain structural complexity and habitat value. The MMP will be completed in the context of the federal and state permitting processes under the Clean Water Act and California Department of Fish and Wildlife Code, and will include success criteria as specified by the permitting agencies. The MMP will also include adaptive management guidelines for actions to be taken if the success criteria are not met.

CEQA

20. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) Documents: Indicate the status of CEQA documents prepared for the project (see instructions).

TYPE OF DOCUMENT	STATUS	DATE COMPLETED (or expected to be complete)	TYPE OF DOCUMENT	STATUS	DATE COMPLETED (or expected to be complete)
Initial Study	Not Applicable		Notice of Preparation	Complete	**09/13/12**
Draft Environmental Impact Report	Complete	**9/12/12**	Final Environmental Impact Report	Complete	**10/25/12**
Negative Declaration	Not Applicable		Mitigated Negative Declaration	Not Applicable	
Notice of Categorical Exemption Exemption Number:	Not Applicable		Notice of Statutory Exemption Exemption Number:	Not Applicable	
Other (describe)	Not Applicable				
Notice of Determination*	Complete	**10/08/12**	*Note: A Notice of Determination or Notice of Exemption from the Lead Agency is required before a certification or waiver can be issued.		

Lead Agency: US Army Corps of Engineers **Contact:** Lisa Mangione **Telephone:** 4155036788

State Clearing House Number: 2010092048_____

ADDITIONAL INFORMATION

21. HAS ANY PORTION OF THE WORK BEEN INITIATED? **YES** ☐ **NO** ☒

IF YES, DESCRIBE THE INITIATED WORK, and explain why it was initiated prior to obtaining a permit. Indicate whether any enforcement action has been taken against the project.

N/A

22. HAS A FEDERAL AGENCY OR THE APPLICANT PROVIDED PUBLIC NOTICE OF THIS APPLICATION FOR WATER QUALITY CERTIFICATION?

Federal Agency:	**YES** ☐	**NO** ☒	**Date:**	**Type of Notification:**	**Agency Name and Contact:**
Applicant:	**YES** ☐	**NO** ☒	**Date:**	**Type of Notification:**	**Media Name and Contact:**

IF PUBLIC NOTICE HAS NOT BEEN MADE, provide the name, address, and phone number (if available) of adjacent property owners, lessees, etc., and any other parties known to be interested in the project:

23. OTHER PERMITS (List other local, state or federal licenses, permits, and agreements that will be required for any construction, operation, maintenance, or other actions associated with the project. Attach copies of all draft or final documents. See instructions.)

AGENCY	CONTACT (with phone number)	TYPE OF APPROVAL	PERMIT OR ID NUMBER	DATE APPLIED	STATUS	DATE OF ACTION
US Corps of Engrs.	Lisa Mangione (415) 5036788	404			In Review	
Ca Dept Fish Game	Tami Schane (415) 8314640	LSAA			In Review	
-Choose One-					-Choose One-	
-Choose One-					-Choose One-	
-Choose One-					-Choose One-	
SF BCDC	Ellie Knecht (415) 3523668	Coastal Development Permit			In Review	
Other or Local Agency					-Choose One-	
Other or Local Agency					-Choose One-	
Other or Local Agency					-Choose One-	

24. OTHER PROJECTS (List and describe other projects implemented or planned that are related to the proposed project, or that may impact the same waterbody. See instructions. Add additional sheets if necessary.)

PROJECT NAME	DESCRIPTION	WATERBODY AND WATERSHED	DATE IMPLEMENTED/PLANNED
See Additional Pages: Box 24: Relationship to Other Projects			

25. Application is hereby made for a permit or permits to authorize the work described in this application. I certify, under penalty of perjury, that this application is complete and accurate to the best of my knowledge. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT DATE SIGNATURE OF AGENT DATE

The application must be signed by the person who desires to undertake the proposed activity (Applicant) or a duly authorized agent if the statement in Block 7 has been filled out and signed.

Attach fee deposit (see Instructions page 7) and any additional documents and submit this application to:

SFBRWQCB
Attention: 401 Water Quality Certification
1515 Clay Street, Suite 1400
Oakland, CA 94612

Note: This form, FORM R2C502-E, was designed for electronic use as a Microsoft Word document or template.
For assistance using this form or to relay suggestions on how it may be improved, please call 510-622-2330.
If you would like a standard, non-electronic form, please call 510-622-2300 and request
401 Application FORM R2C502 – Non-electronic version.

Additional Pages for the Section 401 Water Quality Certification New and Revised Application

San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project, San Mateo and Santa Clara Counties, CA

Submitted To:

San Francisco Bay Regional Water Quality Control Board
Water Quality Certification
1515 Clay Street, Suite 1400
Oakland, CA 94612
Contact: Margarete Beth

Applicant:

San Francisquito Creek Joint Powers Authority
615 B Menlo Avenue
Menlo Park, CA 94025
Contact: Kevin Murray
650/324-1972

Prepared by:

ICF International
620 Folsom Street, Suite 200
San Francisco, CA 94107
Contact: Alexa LaPlante
415/677-7118

July 31, 2014

ICF International. 2014. San Francisquito Creek Joint Powers Authority. 401 Water Quality Certification Application. July. (ICF 00370.10) San Francisco, CA. Prepared for: San Francisquito Creek Joint Powers Authority, Menlo Park, CA. Submitted to: San Francisco Bay Regional Water Quality Control Board.

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Tables

Appendix A: Figures

Preconstruction Notification for San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project

This new and revised application package is based on the Original Application Package submitted on March 12, 2013 and supplemental materials submitted on August 1, 2013 and January 28, 2014. All documents previously submitted to the Water Board are referenced in this New and Revised Application Package.

Box 12: Project Location

The San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project (Project) vicinity is located within the larger Santa Clara watershed basin located within the larger South San Francisco Bay Hydrologic Unit (HUC 18050004). More specifically, it is located within the San Francisquito Creek watershed along creek channel, and is bordered in the west by the Cordilleras Creek watershed, and in the east by the South San Francisco Bay. The project is located within a tidally-influenced zone.

The San Francisquito Creek (Creek) watershed comprises a 45-square-mile basin, extending from Skyline Boulevard to San Francisco Bay. The watershed encompasses public and private lands in the Cities of East Palo Alto, Menlo Park, Palo Alto, Portola Valley, and Woodside; the unincorporated areas of San Mateo and Santa Clara counties; and Stanford University. The San Francisquito Creek floodplain, which has almost no overlap with the watershed, comprises almost 5 square miles. San Francisquito Creek represents the boundary between San Mateo and Santa Clara counties in the lower watershed. The last relatively unaltered urban creek system in the South Bay, San Francisquito Creek begins at the confluence of Corte Madera Creek and Bear Creek, just below Searsville Lake in Stanford University's Jasper Ridge Biological Preserve. The mouth of the Creek opens to the San Francisco Bay adjacent to Palo Alto Airport of Santa Clara County (Palo Alto Airport) to the south and the Baylands Nature Preserve to the north. The system contains more than 71 miles of Creek bed; the mainstem is approximately 14 miles long.

Figure 1 displays the Project vicinity and Figure 2.0 over Project site plan (Appendix A). The project is located along a 1.5-mile stretch of the Creek from San Francisco Bay to East Bayshore Road (a frontage road to U.S. Highway 101). For description purposes, the Project area is divided into three reaches. A reach is a continuous part of the Creek between two specified points. The lower reach is from San Francisco Bay to Friendship Bridge, the middle reach from Friendship Bridge to Daphne Way, and the upper reach from Daphne Way to East Bayshore Road. Additionally, the right bank refers to the San Mateo County (East Palo Alto) side of the Creek and the left bank refers to the Santa Clara County (Palo Alto) side of the Creek. Table 1 provides coordinates for eastern and western extents of the Project site.

Table 1. Coordinates for the San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project

Project Area	Latitude	Longitude	Township/ Range/ Section	USGS Map
East Bayshore Road and US 101	37º27'11" N	122º07'39"W	N/A	Palo Alto
San Francisco Bay	37º27'157" N	122º06'57"W	N/A	Mountain View

There are three small reservoirs in the San Francisquito Creek watershed that were built for water conservation and storage purposes: Searsville Reservoir on Corte Madera Creek, and Felt Reservoir and Lagunita Reservoir, which are off-stream reservoirs fed by diversions from Los Trancos Creek and San Francisquito Creek, respectively. All three reservoirs are owned and maintained by Stanford University. Searsville Reservoir (capacity 952 acre-feet) and Dam is situated just west of the university's Jasper Ridge Biological Preserve. Searsville Dam was built for the Stanford University's water supply, and does not provide potable water, flood control, or hydropower. Searsville Reservoir provides minimal regulation of flows along the Creek (U.S. Geological Survey 2010).

Sediment deposition has greatly reduced the available storage capacity and operational flexibility of Searsville reservoir as a water supply facility. When the Searsville Dam was built in 1892, the reservoir capacity was 1,000 acre-feet. Since then, due to accumulating sediment from upstream, the reservoir has lost over 90% of its original water storage capacity (Stanford University, 2011).

Current reservoir operations allow the lake to be drawn down between May and November for irrigation and fire protection (San Francisquito Creek Joint Powers Authority 2004). The Felt Reservoir is in the Los Trancos Creek subwatershed. Diversions occur upstream from Los Trancos Creek to Los Trancos and Lagunita Canals for irrigation on Stanford University campus (U.S. Geological Survey 2010).

USGS owns and operates a continuous stream gage on San Francisquito Creek. USGS gage number 11164500 is located on the Stanford Golf Course upstream of Junipero Serra Boulevard, provides the best long-term record of flow in the Creek with measurements from 1931 to 1941 and then from 1951 to present. Average annual flow is 21.4 cfs (San Francisquito Creek Joint Powers Authority 2004).

Low flows typically occur in the late summer or early fall, before winter rains begin. Annual minimum 30-day low flows range from zero to about 1.0 cfs. Downstream of the stream gage, low flows infiltrate to groundwater, leaving much of the streambed dry for about 6 months of the year (San Francisquito Creek Joint Powers Authority 2004). It is likely that water utilization, evaporation, and diversion of flow to maintain summer reservoir levels have further reduced spring, summer and fall flows to some extent in the San Francisquito Creek watershed (San Francisquito Creek Joint Powers Authority 2004).

Box 14: Project Purpose

The Project would ultimately improve channel capacity for creek flows coupled with the influence of the tides of San Francisco Bay, including projected Sea Level Rise (SLR), from the downstream face of East Bayshore Road to San Francisco Bay. It would significantly reduce local fluvial flood risks in the Project area during

storm events, provide the capacity needed for future upstream improvements, increase and improve ecological habitat, provide for improved recreational opportunities, and reduced maintenance requirements.

The SFCJPA, formed in 1999 following the flood of 1998, is a regional government agency whose members include the Cities of Palo Alto, Menlo Park, and East Palo Alto; the San Mateo County Flood Control District, and the Santa Clara Valley Water District (District). The SFCJPA implements flood management, ecosystem restoration and recreational enhancements throughout the San Francisquito Creek watershed and floodplain.

Flooding from the Creek is a common occurrence. The most recent flood event occurred as a result of extremely high creek flows on December 23, 2012, when the Creek overtopped its banks in several areas. The maximum instantaneous peak flow recorded at USGS Gage 11164500 during the December 2012 event was 5,400 cfs. An even larger event occurred on a February 1998 event, with a maximum instantaneous peak flow recorded during the February 1998 event was 7,200 cubic feet per second (cfs). The U.S. Army Corps of Engineers (USACE) estimates that the 1998 flood was a 45-year flood event. A 100-year flood event is anticipated to result in flows of 9,400 cfs at the mouth of the Creek. These flows would exceed the existing capacity of the Creek (San Francisquito Creek Joint Powers Authority 2009).

The Project's goals are to improve flood protection, habitat, and recreational opportunities within the Project reach, with the following specific objectives:

- Protect properties and infrastructure between San Francisco Bay and Highway 101 from a 100-year Creek flows occurring at the same time as a 10-year tide that includes projected Sea Level Rise through 2065.
- Accommodate future flood protection measures that might be constructed upstream of the Project.
- Enhance habitat along the Project reach, particularly habitat for threatened and endangered species.
- Enhance recreational uses.
- Minimize operational and maintenance requirements.

The Project would increase conveyance and retention capacity of floodwaters from runoff and San Francisco Bay tides to protect residents and property from flood events along the lower section of the Creek, from East Bayshore Road to the San Francisco Bay.

Box 15: Description of Activity and Environmental Impacts

The Project will result in 8.31 acres of permanent impacts and 3.14 acres temporary impacts, for a total of 11.44 acres of impacts to waters of the state. Permanent impacts comprise all areas that will be permanently modified as part of the Project, such as those associated with earthwork (i.e., excavation and fill) and O&M areas (i.e., new roads and O&M work areas). Some of these elements overlap but they are all included in the totals. Those totals include the RSP that was outside of the earthwork. Temporary impacts include areas that will may be impacted during construction activities, such as staging and stockpiling areas, temporary access roads, and re-established revegetated areas, but will be restored (i.e., re-graded and re-vegetated) post-construction. Table 4, Summary of Water Bodies, below provides detail on permanent and temporary impact areas.

Project Elements

The San Francisquito Creek Joint Powers Authority (SFCPJA) proposes the Project. This Project would increase conveyance and retention capacity of floodwaters from runoff and extreme San Francisco Bay tides to protect residents and property from flood events along the lower section of the Creek, from East Bayshore Road to the San Francisco Bay. An Environmental Impact Report was approved October 25th, 2012 (http://sfcjpa.org/web/documents/docs/docs-sf-bay-highway-101-project-final-eir/). Work within the project boundary includes the following activities. The project elements are identified in Appendix A, Figure 2.

- Excavating sediment deposits within the channel to maximize flow capacity.
- Rebuilding levees, degrading levees, and relocating a portion of the southern levee to widen the channel and thus reduce influence of tides and increase channel capacity.
- Constructing floodwalls in the upper reach to increase capacity and maintain consistency with Caltrans' enlargement of the U.S. 101/East Bayshore Road Bridge over San Francisquito Creek (Caltrans facility).

Original Project elements include:

- Levee setback and improvements to widen the channel and increase levee height and stability between East Palo Alto and the Palo Alto Golf Course.
- Floodwalls in the upper reach downstream of East Bayshore Road.
- Extension of Friendship Bridge via a boardwalk across new marshland within the widened channel.

Since the submittal of the January 28, 2014 Supplemental Application Materials to the Water Board, the SFCJPA has modified the Project in three substantive ways:

1. **Faber Tract levee stability improvement** – Fill will be added to the Faber Tract Levee to reduce concerns regarding levee erosion and the potential for mass levee failure. Raising the lowest levee crest elevation downstream of Friendship Bridge from a minimum elevation of 11 feet to 13 feet, and incorporating a 6H:1V levee side slope into the Faber Tract marsh. The 6H:1V levee side slope will help protect the levee toe from erosion due to flow overtopping over a 400 foot distance as it transitions to a higher elevation (as part of the Original Application), as the levee transitions upstream to a higher elevation (as part of the Original Application) closer to the Bridge. The new area of impact from the existing levee toe to the proposed levee toe is approximately 0.42 acres (18,383 square feet).

2. **Bay levee degrade** - Downstream of Faber Tract, in a marsh area that is subject to daily tides from the San Francisco Bay, a levee degrade will remove approximately 600 feet of the existing levee (STA 3+50 to 9+50). This will further connect the marsh from creek and decrease the water surface elevation during large flood events, allowing the channel to expand out over the marsh area at a point further upstream than under existing conditions.

3. **Rock Slope Protection (RSP) Reduction** - Proposed rock-slope levee protection (RSP) will be reduced by 1.61 acres (70,171 square feet) from what previously proposed, resulting in a new RSP area total

of 5.86 acres. The 1.61 acres will be replaced with vegetative levee protection and turf reinforcement mat that will provide soil stabilization and habitat improvements.

The Project has two main components: Levee and Floodwall Construction and Marshplain Restoration. Each component contains multiple elements summarized in Table 2 below.

Table 2. Summary of Project Elements

Project Component	Description
Levee and floodwall construction	
Levee raising and widening on right bank	From the existing Friendship Bridge to approximately 0.25 mile downstream of Friendship Bridge, between the Creek and Faber Tract.
Levee raising on right bank	Raising and strengthening the levee from the O'Connor Pump Station tie-in near Friendship Bridge to the floodwall.
Levee degrade	Just upstream of the Creek's confluence with the San Francisco Bay.
Floodwall on right bank	The right floodwall would extend from just downstream of Daphne Way to the end of the Project reach where it would connect with the Caltrans U.S. 101/East Bayshore Road facility.
Levee raising on left bank and levee relocation	A new stronger and taller levee would be relocated inland (currently occupied by the Golf Course) creating space on the south bank for a marshplain terrace. Except for a section around the eastern footings of Friendship Bridge, the existing levee along this stretch would be removed. Trails that would also act as maintenance roads would be constructed on top of the levees and behind the floodwalls.
Floodwall on left bank	The left floodwall would extend from just downstream of Geng Road, along the streambed, around the Palo Alto Pump Station, to the end of the Project reach where it would connect with the Caltrans facility.
Downstream access road on right bank	The right bank downstream access road would be approximately 16 feet wide and extend from the crown of the right levee to street level to just downstream of Daphne Way.
Upstream access road on right bank	The right bank upstream access road would be approximately 12 feet wide and would extend from just downstream of Verbena Drive to the Caltrans facility at East Bayshore Road.
Access road on left bank	The left bank access road would be generally 12 feet wide and would extend from a point downstream of the International School of the Peninsula to the Palo Alto Pump Station. The access road would also be used as a public trail within the City of Palo Alto and would connect to the Baylands Athletic Center.
Friendship Bridge	The existing Friendship Bridge would be retained and extended as a boardwalk from the retained eastern footing across the new marshplain terrace to the relocated south bank levee.
Marshplain restoration	
Upstream of Friendship Bridge on right bank	High-marsh and transitional vegetation would be planted from the edge of the Creek channel to the toe of the levee from just upstream of Friendship Bridge to East Bayshore Road.
Left bank	High-marsh and transitional vegetation would be planted from the edge of the Creek channel to the base of the floodwall or the toe of the levee. In this area the marsh would be planted adjacent to the toe of the cut-and-fill area. The marsh would extend from the point at which the new levee would diverge inland from the existing levee to East Bayshore Road.

Utility Relocation

Project activities would require relocation of electricity transmission towers and poles; abandonment of existing and construction of new gas transmission lines; and realignment or relocation of sewer lines and storm drains (Environmental Impact Report, Figure 2-4).

Construction

Construction of Project elements would likely occur over two years. Construction would begin in 2015 starting with utility modification and building the new levee of the south bank outside of the existing levee. Work would progress upstream and be completed by 2016.

Construction activities would take place between 8 a.m. and 6 p.m. on weekdays, and 9 a.m. and 5 p.m. on Saturdays, in accordance with City of Palo Alto and City of East Palo Alto municipal codes. Final construction permits issued for the Project may place additional constraints on construction timing. Table 2 shows a concise description of the Project elements

A summary of the anticipated construction methodology, the proposed starting date and duration of each activity, and the equipment to be used during each phase is listed in Table 3.

Table 3. Summary of Construction Methodology, Timing, and Equipment

Project Component	Proposed Starting Date	Activity	Proposed Duration	Equipment
Utility Relocation				
PG&E Electricity Transmission	2/2015	Construction of shoo-fly tower at T3	2 weeks	1 pickup 1 four-door pickup 1 2-ton tool truck with air compressor 1 dump truck 1 70-ton crane 1 caterpillar (pile driver) 1 back hoe 1 concrete truck 1 pump truck
	2/2015	Tower raises (T1 and T4)	2 weeks (1 week per tower)	
	3/2015	New tower construction and demolition of T2	4 weeks	
	4/2015	Demolition of shoo-fly	1 day	
East Palo Alto Sanitary District sewer main	4/2015	Sewer line relocation	6 weeks	1 backhoe 1 flatbed truck
PG&E Gas Transmission	4/2015	Gas line work	4 weeks	2 4-door pickups 1 backhoe 2 flatbed truck
	4/8/2015	directional drilling	2 weeks	1 directional drill rig
	4/18/2015	export of material	1 week	2 dump trucks 1 flatbed truck

Project Component	Proposed Starting Date	Activity	Proposed Duration	Equipment
	4/25/2015	concrete	2 days	1 concrete truck
	4/27/2015	Demobilization	1 week	2 4-door pickups 1 flatbed truck
Phase One—Levees and Excavation				
Site Preparation	4/2015	Mobilization Tree Removal Clearing and Grubbing Stripping Demolition	6 weeks	4 four-door pickups 1 backhoe 1 loader 1 jackhammer 1 flat-bed truck
Construction of new left bank levee	5/2015	Site excavation Levee construction Seeding for erosion control	5 weeks	4 four-door pickups 3 excavators 1 backhoe 2 loaders 4–6 dump trucks (20 cy each) 2 water trucks
Removal of old left bank levee	7/2015	Site excavation	3 weeks	4 four-door pickups 3 excavators 1 backhoe 2 loaders 4–6 dump trucks (20 cy each) 2 water trucks
Removal of right bank levee	7/2015	Site excavation Relocation of East Palo Alto sewer line and siphon	2 weeks	4 four-door pickups 3 excavators 1 backhoe 2 loaders 4–6 dump trucks (20 cy each) 2 water trucks
Construction of right bank levee	8/2015	Levee construction Seeding for erosion control	3 weeks	4 four-door pickups 3 excavators 1 backhoe 2 loaders 4–6 dump trucks (20 cy each) 2 water trucks
Construction of downstream access road on right and left banks	9/2015	Site preparation and paving	4 weeks	4 four-door pickups 1 dump truck 1 grader 1 four-door pickup 2 concrete trucks 1 asphalt paver 1 compactor
Friendship Bridge	10/2015	Site excavation Boardwalk construction	6 weeks	4 four-door pickups 1 backhoe 1 loader 1 flat-bed truck

Project Component	Proposed Starting Date	Activity	Proposed Duration	Equipment
Channel widening and marshplain terracing	7/2015	Site excavation Terracing	10 weeks	4 four-door pickups 3 excavators 1 backhoe 2 loaders 4–6 dump trucks (20 cy each) 2 water trucks
Revegetation	10/2015	Installation of irrigation system Revegetation	6 weeks	2 four-door pickups
Phase Two—Floodwalls				
Site Preparation	5/2016	Mobilization Clearing and grubbing	3 weeks	4 four-door pickups 1 backhoe 1 loader 1 jackhammer 1 flat-bed truck
Installation of right and left bank floodwalls	6/2016	Site excavation Preparation of foundation Construction of floodwalls	5 months	4 four-door pickups 1 excavator 1 trencher 1 backhoe 1 loader 1 dump truck 1 grader 2 concrete trucks 1 flat-bed truck
Construction of upstream access road on right and left banks	10/2016	Site preparation and paving	4 weeks	4 four-door pickups 1 dump truck 1 grader 1 four-door pickup 2 concrete trucks 1 asphalt paver 1 compactor
Site Restoration	11/2016	Demobilization	2 weeks	2 four-door pickups 1 loader 1 flat-bed truck

Detailed information for the construction and purpose of each element of the project can be found in Biological Assessment.

Marshplain Creation and Restoration

The Project would create approximately 13.59 acres of tidal marsh on both sides of the Creek, effectively restoring tidal influence in the Project reach (see Figure 2). Marshplain creation would span the entire Project extent on both banks from East Bayshore Road to San Francisco Bay on the right bank and from East Bayshore Road to Friendship Bridge on the left bank. Both sides of the channel would be planted from the toe of the levee or base of the floodwall to the edge of the Creek channel.

After levee construction is complete, the tidal marsh area would be terraced and revegetated with high-marsh plants. The high-marsh planting area would total 5.93 acres and the high-marsh transition planting area would total 7.66 acres. Additional vegetative areas will be created with the installation of vegetated shrub bands across the RSP area and vegetative levee protection to provide refugia and promote long term vegetated protection and stability.

Native marsh plants would be used to revegetate the terraced land. Plants appropriate to the high marsh would be planted near the stream channel. Plants native to marsh transition areas would be planted in areas more distant from the Creek channel. The SFCJPA, or its designated contractor, will be responsible for the acquisition of plant material. All container stock will be propagated from native stock collected within the south San Francisco Bay and tidally influenced creeks in coordination with Santa Clara Valley Water District staff.

Box 16: Avoidance of Impacts

1. The following measures will be implemented as necessary to reduce and minimize stormwater pollution during ground disturbing maintenance activities:
    - Soils exposed due to maintenance activities will be seeded and stabilized using hydroseeding, straw placement, mulching, and/or erosion control fabric. These measures will be implemented such that the site is stabilized and water quality protected prior to significant rainfall.
    - The preference for erosion control fabrics will be to consist of natural fibers.
    - Appropriate measures include, but are not limited to, the following:
    - Silt Fences.
    - Straw Bale Barriers.
    - Brush or Rock Filters.
    - Storm Drain Inlet Protection.
    - Sediment Traps.
    - Sediment Basins.
    - Erosion Control Blankets and Mats.
    - Soil Stabilization (i.e. tackified straw with seed, jute or geotextile blankets, etc.).
    - Wood chips.
    - Straw mulch.
    - All temporary construction-related erosion control methods will be removed at the completion of the Project (e.g., silt fences). (Santa Clara Valley Water District Water Quality BMP 41)
2. The following measures will be implemented to ensure sediments will be stored and transported in a manner that minimizes water quality effects:
    - Wet sediments may be stockpiled outside of a live stream or may be stockpiled within a dewatered stream so water can drain or evaporate before removal.
    - This measure applies to saturated, not damp, sediments and depends on the availability of a stockpile site.
    - For those stockpiles located outside the channel, water draining from them will not be allowed to flow back into the Creek or into local storm drains that enter the Creek, unless water quality protection measures recommended by RWQCB are implemented.

- Trucks may be lined with an impervious material (e.g., plastic), or the tailgate blocked with dry dirt or hay bales, for example, or trucks may drain excess water by slightly tilting their loads and allowing the water to drain out.
- Water will not drain directly into channels (outside of the work area) or onto public streets without providing water quality control measures
- Streets and affected public parking lots will be cleared of mud and/or dirt by street sweeping (with a vacuum-powered street sweeper), as necessary, and not by hosing down the street. (Santa Clara Valley Water District Water Quality BMP 4)

3. Oily, greasy, or sediment-laden substances or other material that originate from the Project operations and may degrade the quality of surface water or adversely affect aquatic life, fish, or wildlife will not be allowed to enter, or be placed where they may later enter, any waterway.

4. The following measures will be implemented to ensure the Project will not increase the turbidity of any watercourse flowing past the construction site by taking all necessary precautions to limit the increase in turbidity as follows:
   - Where natural turbidity is between 0 and 50 Nephelometric Turbidity Units (NTU), increases will not exceed 5 percent.
   - Where natural turbidity is greater than 50 NTU, increases will not exceed 10 percent.
   - Where the receiving water body is a dry creek bed or storm drain, waters in excess of 50 NTU will not be discharged from the Project.
   - Water turbidity changes will be monitored. The discharge water measurements will be made at the point where the discharge water exits the water control system for tidal sites and 100 feet downstream of the discharge point for non-tidal sites. Natural watercourse turbidity measurements will be made in the receiving water 100 feet upstream of the discharge site. Natural watercourse turbidity measurements will be made prior to initiation of Project discharges, preferably at least 2 days prior to commencement of operations. (Santa Clara Valley Water District Water Quality BMP 40)

5. No washing of vehicles will occur at job sites. (Santa Clara Valley Water District Hazards & Hazardous Materials BMP 9).

6. No fueling will be done in a waterway or immediate flood plain, unless equipment stationed in these locations is not readily relocated (i.e., pumps, generators).
   - For stationary equipment that must be fueled on the site, containment will be provided in such a manner that any accidental spill of fuel will not be able to enter the water or contaminate sediments that may come in contact with water.
   - Any equipment that is readily moved out of the waterway will not be fueled in the waterway or immediate flood plain.
   - All fueling done at the job site will provide containment to the degree that any spill will be unable to enter any waterway or damage riparian vegetation. (Santa Clara Valley Water District Hazards & Hazardous Materials BMP 10)

7. No equipment servicing will be done in a stream channel or immediate flood plain, unless equipment stationed in these locations cannot be readily relocated (i.e., pumps, generators).
   - Any equipment that can be readily moved out of the channel will not be serviced in the channel or immediate flood plain.

- All servicing of equipment done at the job site will provide containment to the degree that any spill will be unable to enter any channel or damage stream vegetation.
- If emergency repairs are required in the field, only those repairs necessary to move equipment to a more secure location will be done in a channel or flood plain.
- If emergency repairs are required, containment will be provided equivalent to that done for fueling or servicing.

8. Measures will be implemented to ensure that hazardous materials are properly handled and the quality of water resources is protected by all reasonable means.
   - Prior to entering the work site, all field personnel will know how to respond when toxic materials are discovered.
   - The discharge of any hazardous or nonhazardous waste as defined in Division 2, Subdivision 1, Chapter 2 of the California Code of Regulations (CCR) will be conducted in accordance with applicable state and federal regulations.
   - In the event of any hazardous material emergencies or spills, personnel will call the Chemical Emergencies/Spills Hotline at 1 800 510 5151. (Santa Clara Valley Water District Hazards & Hazardous Materials BMP 12)
9. Prevent the accidental release of chemicals, fuels, lubricants, and non-storm drainage water.
   - Field personnel will be appropriately trained in spill prevention, hazardous material control, and cleanup of accidental spills.
   - No fueling, repair, cleaning, maintenance, or vehicle washing will be performed in a creek channel or in areas at the top of a channel bank that may flow into a creek channel. (Santa Clara Valley Water District Hazards & Hazardous Materials BMP 13)
10. Spill prevention kits appropriate to the hazard will always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations).
    - Prior to entering the work site, all field personnel will know the location of spill kits on crew trucks and at other locations within District facilities.
    - All field personnel will be advised of these locations and trained in their appropriate use. (Santa Clara Valley Water District Hazards & Hazardous Materials BMP 14)
11. Runoff from soil stockpiles will be avoided. If soil is to be stockpiled, no runoff will be allowed to flow to a creek.
12. Coffer dams will be used for tidal work areas. For tidal areas, a downstream cofferdam will be constructed to prevent the work area from being inundated by tidal flows. By isolating the work area from tidal flows, water quality effects are minimized. Downstream flows continue through the work area and through pipes within the cofferdam.
    - Installation of coffer dams will begin at low tide.
    - Waters discharged through tidal coffer dam bypass pipes will not exceed 50 NTU over the background levels of the tidal waters into which they are discharged.
    - Coffer dams shall not be constructed of earthen fill due to potential adverse water quality impacts in the event of a failure.
    - Coffer dams constructed of gravel shall be covered by a protective covering (e.g., plastic or fabric) to prevent seepage.

13. Groundwater will be managed at work sites. If high levels of groundwater in a work area are encountered, the water will be pumped out of the work site. If necessary to protect water quality, the water will be directed into specifically constructed infiltration basins, into holding ponds, or onto areas with vegetation to remove sediment prior to the water re-entering a receiving water body. Water pumped into vegetated areas will be pumped in a manner that will not create erosion around vegetation.
14. Sanitary/septic waste will be managed. Temporary sanitary facilities will be located on jobs that last multiple days in compliance with California Division of Occupational Safety and Health (Cal/OSHA) regulation 8 CCR 1526. All temporary sanitary facilities will be placed outside of the Creek channel and flood plain and removed when no longer necessary.
15. SFCJPA will be responsible for ensuring compliance with all local and State regulations, including the RWQCB NPDES permits and local BMPs for jurisdictions adjoining the Project site. As part of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) and the San Mateo Countywide Stormwater Pollution Prevention Program (SM-STOPPP), required under San Francisco Bay Region Municipal Regional Stormwater NPDES Permit (Order R2-2009-0074), all construction sites are required to have site-specific and seasonally and phase-appropriate effective BMPs (San Francisco Bay Regional Water Quality Control Board 2009). SFCJPA shall be covered under the new National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activities (Order 2009-0009-DWQ as amended by 2010-0014-DWQ)(Construction General Permit), which became effective on July 1, 2010. The Project specifications require that the Project construction contractor prepare a SWPPP and erosion control and sedimentation plan showing placement of BMPs at various stages of construction in conformance with requirements, and all SWPPP documents and plans will be approved by a State-certified Qualified SWPPP Developer (QSD) and compliance with the Construction General Permit will be overseen by a State-certified Qualified SWPPP Practitioner (QSP) . The Project will implement measures to accomplish objectives specified in SFCJPA's San Francisquito Creek Watershed Analysis and Sediment Reduction Plan, which fulfills NPDES permit provisions that require the co-permittees of the SCVURPPP and SM-STOPPP within the Creek watershed to assess and implement sediment management measures in the watershed (San Francisquito Creek Joint Powers Authority 2004). Water quality protection standards during construction will comply with the most protective and effective BMPs of the local jurisdictions and the State of California.

Box 20: CEQA

The Final Environmental Impact Report (EIR) for the San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project San Francisco Bay to Highway 101 was certified by the lead agency, the SFCJPA, in November 2012 (SCH 2010092048). The Notice of Preparation can be found online at: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK=645951, and the Draft EIR is available online at: http://www.ceqanet.ca.gov/DocDescription.asp?DocPK=663670. The Final EIR is available on the SFCJPA's website at: http://sfcjpa.org/web/documents/docs/docs-sf-bay-highway-101-project-final-eir/. The Notice of Determination (NOD) and Findings of Fact and Statement of Overriding Considerations (SOC) are provided in the enclosed CD's.

Box 24: Dredge and Fill Information

Wetlands affected by the San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project include diked marsh, freshwater marsh, and tidal salt marsh habitat and "other waters" include San Francisquito Creek, one freshwater pond in the golf course. All affected water bodies were determined to be waters of the State. Table 4 provides a summary of all water bodies within the project area and those affected by the proposed project. With removal of the rock slope protection associated with the levee degrade, the permanent impacts associated with TSM-4 were the only changed conditions.

Table 4. Summary of Water Bodies

Water Body Type	ID	Reason For Action	Amount and Type of Material Cut (CY)	Amount and Type of Material Fill (CY)	Surface Area Affected (P acre)	Surface Area Affected (T acre)
Diked Marsh	DM-1	Levee	0	0	0	0.15
Diked Marsh	DM-2	Levee	0	0	0	0.01
Diked Marsh	DM-3	Levee	0	0	0.02	0.01
Diked Marsh	DM-4	Levee	0	0	0	0.01
Diked Marsh	DM-5		0	0	0	0
Diked Marsh	DM-6		0	0	0	0
Diked Marsh	DM-7	Levee	0	0	0	0
Diked Marsh	DM-8	Levee, Pavement, Cut of Floodplain Bench (CFB)	459	11,287	1.33	0
Diked Marsh	DM-9	Levee, Rock(RSP), Gravel	0	1,230	0.18	0.02
Diked Marsh	DM-10	Levee, RSP, CFB	0	2224	0.80	0
Diked Marsh	DM-11	Levee	0	2,301	0.24	0
Diked Marsh	DM-12	Levee	0	1,344	0.10	0
Diked Marsh	DM-13	Levee, CFB	46	607	0.21	0
Freshwater Marsh	FM-1	Levee	0	882	0.19	0
Freshwater Marsh	FM-2	Levee	0	740	0.14	0
Tidal Salt Marsh	TSM-1	Levee, CFB	2,903	1,242	1.50	0.26
Tidal Salt Marsh	TSM-3	Levee, RSP, CFB	193	0	0.00	0.00
Tidal Salt Marsh	TSM-4	Levee, RSP, CFB	0	1,216	0.05	0.16

Water Body Type	ID	Reason For Action	Amount and Type of Material Cut (CY)	Amount and Type of Material Fill (CY)	Surface Area Affected (P acre)	Surface Area Affected (T acre)
Tidal Salt Marsh	TSM-5	Levee	2	0	0.35	0.33
Tidal Salt Marsh	TSM-6		25	0	0.01	0
Tidal Salt Marsh	TSM-7	Levee, RSP, CFB	83	21	0.02	0.16
Tidal Salt Marsh	TSM-8		0	0	0.14	0.16
Tidal Salt Marsh	TSM-9	Levee, RSP, CFB	1,106	1,590	0.00	0.42
Tidal Salt Marsh	TSM-10	Levee, CFB	3	0	1.03	0
Tidal Salt Marsh	TSM-11	Levee, RSP, CFB	146	64	0.05	0
Tidal Salt Marsh	TSM-12	Levee, CFB	32	0	0.03	0
Subtotal Wetlands			3995	19748	6.38	1.52
Freshwater Pond	FP-1	Levee	0	5,604	1.13	0
Tidal Channel and Bay Waters	TC-1	Levee	0	0	0	0.02
Tidal Channel and Bay Waters	TC-2	Levee, RSP, CFB	342	2,353	0.80	1.59
Tidal Pan	TP-1		0	0	0	0
Tidal Pan	TP-2		0	0	0	0
Tidal Pan	TP-3		0	0	0	0
Subtotal Other Water Bodies			342	2,957	1.93	1.79
PROJECT TOTAL			**4,337**	**35,613**	**8.31**	**3.14**

Rock Slope Protection

As previously mentioned, the new design has resulted in the reduction of approximately 1.61 acres (70,171 square feet) of RSP compared to the Project design as January 28, 2014 Supplemental Application Materials. Please see Appendix A, Figure 2 for the Project Site Plans and Table 5 below. This

table also includes gravel and pavement which accounts for the difference in grand totals in Table 5 and the 1.61 acres of rock slope protection.

Table 5. Rock Slope Protection

Row Labels	Values	
	Volume (CY)	Area (sf)
Diked Marsh		
DM 10		
Additional Fill Volume	13.7	184
Rock Slope - 2ft	13.7	184
Subsurface Volume (Requires over-excavation)	369.9	2,699
Levee Toe Rock	369.9	2,699
DM 8		
Additional Fill Volume	87.6	4,732
Pavement	87.6	4,732
Subsurface Volume (Requires over-excavation)	0.6	5
Levee Toe Rock	0.6	5
DM 9		
Additional Fill Volume	8.9	478
Gravel	8.9	478
Tidal Channel and Bay Waters		
TC 2		
Subsurface Volume (Requires over-excavation)	528.5	3,785
Floodwall Toe Rock	46.0	264
Levee Toe Rock	482.5	3,521
Tidal Salt Marsh		
TSM 1		
Additional Fill Volume	1.1	15
Rock Slope - 2ft	1.1	15
Subsurface Volume (Requires over-excavation)	587.2	4,285
Levee Toe Rock	587.2	4,285
TSM 3		
Subsurface Volume (Requires over-excavation)	66.3	381
Floodwall Toe Rock	66.3	381
TSM 4		
Additional Fill Volume	14.7	796
Gravel	14.7	796
TSM 7		
Additional Fill Volume	75.0	675
Rock Slope - 3ft	75.0	675
Subsurface Volume (Requires over-excavation)	535.6	3,909

Levee Toe Rock	535.6	3,909
TSM 9		
Additional Fill Volume	61.9	557
Rock Slope - 3ft	61.9	557
Subsurface Volume (Requires over-excavation)	683.0	4,984
Levee Toe Rock	683.0	4,984
Non-Wetland		
Non-Wetland		
Additional Fill Volume	6204.0	152,029
Gravel	1186.8	64,086
Pavement	726.8	39,247
Rock Slope - 2ft	2240.5	30,247
Rock Slope - 3ft	2050.0	18,450
Subsurface Volume (Requires over-excavation)	13922.8	90,704
Floodwall Toe Rock	7016.9	40,310
Levee Toe Rock	6905.9	50,395
Grand Total	**23160.7**	**270,218**

Verification of Water Bodies

During July 6,7, 8, 2010 and February 22, 2012, an ICF soil and wetland scientist and ICF botanist delineated a total of 140.11 acres of potential waters of the United States within the project area, including 13 diked marsh wetlands (4.34 acres), two freshwater marsh wetlands (0.33 acre), 11 tidal salt marsh wetlands (112.26 acres), one freshwater pond (1.13 acres), three tidal channel and bay waters (1.13 acres), and three tidal pans (0.37 acre) using the routine onsite determination method described in the 1987 USACE Wetlands Delineation Manual (Environmental Laboratory 1987) and where applicable, criteria specified in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Arid West Supplement) (U.S. Army Corps of Engineers 2008). On February 5, 2013, Ian Liffmann from the USACE, San Francisco District, conducted a field visit to verify the results of the delineation, accompanied Joel Butterworth of ICF International.

Box 24: Relationship to Other Projects

Concurrently, the California Department of Transportation (Caltrans) is in the process of planning and design to replace the U.S. Highway 101 (U.S. 101), East Bayshore Road, and West Bayshore Road crossings over the Creek, and will improve the Creek conveyance capacity of the structures to the SFCJPA's design standards. The SFCJPA is also working as the local sponsor with USACE to initiate a comprehensive flood management plan for San Francisquito Creek. The Project also adjoins areas of the San Francisco Bay covered by the South Bay Salt Ponds Restoration Project and the South San Francisco Bay Shoreline Study.

The South Bay Salt Ponds Restoration Project will restore tidal connectivity to some 15,000 acres of former salt evaporation ponds recently acquired from Cargill Inc. by a coalition of federal and state resource agencies and private foundations. Additional goals include providing opportunities for public access and recreational use and improving South San Francisco Bay flood management. For more information on the South Bay Salt Ponds Restoration Project, see the project web page at http://www.southbayrestoration.org/index.html.

The South San Francisco Bay Shoreline Study is a joint undertaking by USACE, the California Coastal Conservancy, and the District, and is aimed at identifying one or more projects for flood damage reduction and ecosystem restoration to be recommended for federal funding. Other participating agencies are the U.S. Fish and Wildlife Service (USFWS), DFG, and the Alameda County Flood Control District. For more information on the South San Francisco Bay Shoreline Study, see the project web page at http://www.southbayshoreline.org/index.html.

Since the fall of 2009, staff from the SFCJPA and one of its member agencies, the District, have been analyzing capital improvements necessary to provide 100-year flood protection for the flood-prone reach of San Francisquito Creek upstream of U.S. 101. Creek capacity improvements under analysis include bridge replacement, channel widening and naturalization, floodwall construction or enhancement, a bypass culvert, and an upstream detention facility. It is likely that a suite of these alternatives will be required to address the flooding problem. This analysis is being conducted locally, but adheres to USACE's planning standards. It is important to note that upstream improvements to flow capacity cannot not be constructed until project improvements at U.S. 101 and downstream to the San Francisco Bay are completed.

The Palo Alto Municipal Golf Course (Golf Course) Reconfiguration Project is an effort being undertaken by the City of Palo Alto, in response to the planning of this Project, to determine how to reconfigure the Golf Course to accommodate the San Francisquito Creek Flood Protection and continue to maintain the Golf Course's number of holes and par rating. The Golf Course Project also contemplates other recreational improvements at the Golf Course site. For more information on the Palo Alto Municipal Golf Course Reconfiguration Project, see the Golf Course web page at http://www.cityofpaloalto.org/gov/depts/csd/golf/default.asp.

ERRATA FOR THE NEW AND REVISED SECTION 401 WATER QUALITY CERTIFICATION APPLICATION AND ADDITIONAL PAGES

SAN FRANCISQUITO CREEK FLOOD REDUCTION, ECOSYSTEM RESTORATION, AND RECREATION PROJECT, SAN MATEO AND SANTA CLARA COUNTIES, CA

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July 31 2014

ICF International. 2014. Errata for the New and Revised 401 Water Quality Certification Application and Additional Pages– San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project San Mateo and Santa Clara Counties, CA. July. (ICF 00370.10) San Francisco, CA. Prepared for the San Francisquito Creek Joint Powers Authority, Menlo Park, CA.

Introduction

This document is an errata that identifies revised application materials in the 401 Water Quality Certification Application (WCQ Application) from modifications to the San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project (Project). These application materials are presented in the order they appear in the WQC Application, with the relevant page number(s) indicated with italicized print. New or revised text is shown with underline for additions and ~~strike-out~~ for deletions. Not all text from the application is included in the errata, only relevant text or tables with changes are included.

Text Revisions

This new and revised application package is based on the Original Application Package submitted on March 12, 2013 and supplemental materials submitted on August 1, 2013 and January 28, 2014. All documents previously submitted to the Water Board are referenced in this New and Revised Application Package.

Box 12- Project Location

Figure 1 displays the project ~~site~~ vicinity and Figure 2.0, the overall project site plan (Appendix A)~~area~~. The project is located along a 1.5-mile stretch of the Creek from San Francisco Bay to East Bayshore Road (a frontage road to U.S. Highway 101). For description purposes, the Project area is divided into three reaches. A reach is a continuous part of the Creek between two specified points. The lower reach is from San Francisco Bay to Friendship Bridge, the middle reach from Friendship Bridge to Daphne Way, and the upper reach from Daphne Way to East Bayshore Road. Additionally, the right bank refers to the San Mateo County (East Palo Alto) side of the Creek and the left bank refers to the Santa Clara County (Palo Alto) side of the Creek. Table 1 provides coordinates for eastern and western extents of the Project site.

There are three small reservoirs in the San Francisquito Creek watershed that were built for water conservation and storage purposes: Searsville Reservoir on Corte Madera Creek, and Felt Reservoir and Lagunita Reservoir, which are off-stream reservoirs fed by diversions from Los Trancos Creek and San Francisquito Creek, respectively. All three reservoirs are owned and maintained by Stanford

University. Searsville Reservoir (capacity 952 acre-feet) and Dam is situated just west of the university's Jasper Ridge Biological Preserve. Searsville Dam was built for the Stanford University's water supply, and does not provide potable water, flood control, or hydropower. Searsville Reservoir provides minimal regulation of flows along the Creek (U.S. Geological Survey 2010).

Sediment deposition has greatly reduced the available storage capacity and operational flexibility of Searsville reservoir as a water supply facility. When the Searsville Dam was built in 1892, the reservoir capacity was 1,000 acre-feet. Since then, due to accumulating sediment from

upstream, the reservoir has lost over 90% of its original water storage capacity (Stanford University, 2011).

Current reservoir operations allow the lake to be drawn down between May and November for irrigation and fire protection (San Francisquito Creek Joint Powers Authority 2004). The Felt

Reservoir is in the Los Trancos Creek subwatershed. Diversions occur upstream from Los Trancos Creek to Los Trancos and Lagunita Canals for irrigation on Stanford University campus (U.S. Geological Survey 2010).

USGS owns and operates a continuous stream gage on San Francisquito Creek. USGS gage number 11164500 is located on the Stanford Golf Course upstream of Junipero Serra Boulevard, provides the best long-term record of flow in the Creek with measurements from 1931 to 1941 and then from 1951 to present. Average annual flow is 21.4 cfs (San Francisquito Creek Joint Powers Authority 2004).

Low flows typically occur in the late summer or early fall, before winter rains begin. Annual minimum 30-day low flows range from zero to about 1.0 cfs. Downstream of the stream gage, low flows infiltrate to groundwater, leaving much of the streambed dry for about 6 months of the year (San Francisquito Creek Joint Powers Authority 2004). It is likely that water utilization, evaporation, and diversion of flow to maintain summer reservoir levels have further reduced spring, summer and fall flows to some extent in the San Francisquito Creek watershed (San Francisquito Creek Joint Powers Authority 2004)

Box 14- Project Purpose

The Project would ultimately improve channel capacity for creek flows coupled with the influence of the tides of San Francisco Bay, including projected Sea Level Rise (SLR), from the downstream face of East Bayshore Road to San Francisco Bay. It would significantly reduce local fluvial flood risks in the Project area during storm events, provide the capacity needed for future upstream improvements, increase and improve ecological habitat, and provide for improved recreational opportunities, and reduced maintenance requirements.

The SFCJPA, formed in 1999 following the flood of 1998, is a regional government agency whose members include the Cities of Palo Alto, Menlo Park, and East Palo Alto; the San Mateo County Flood Control District, and the Santa Clara Valley Water District (District). The SFCJPA implements flood management, ecosystem restoration and recreational enhancements throughout the San Francisquito Creek watershed and floodplain.

Flooding from the Creek is a common occurrence. The most recent flood event occurred as a result of extremely high creek flows ~~in~~ on December ~~22~~ 23, 2012, when the Creek overtopped its banks in several areas.

- Protect properties and infrastructure between San Francisco Bay and Highway 101 from a 100-year Creek flows occurring at the same time as a 10-year tide that includes projected Sea Level Rise through 2065.
- ~~Protect properties and infrastructure between East Bayshore Road and the San Francisco Bay from Creek flows resulting from 100-year fluvial flood flows occurring at the same time as a 100-year tide that includes projected Sea Level Rise through 2065.~~

- Accommodate future flood protection measures that might be constructed upstream of the Project.
- Enhance habitat along the Project reach, particularly habitat for threatened and endangered species.
- Enhance recreational uses.
- Minimize operational and maintenance requirements.

Box 15- Description of Activity and Environmental Impacts
The Project will result in ~~7.99~~ 8.31 acres of permanent impacts and ~~0.6~~ 3.14 acres of temporary impacts, for a total of 11.44 acres of impacts to waters of the state. Permanent impacts comprise all areas that will be permanently modified as part of the Project, such as those associated with earthwork (i.e., excavation and fill) and O&M areas (i.e., new roads and O&M work areas). Some of these elements overlap but they are all included in the totals. Those totals include the RSP that was outside of the earthwork. Temporary impacts include areas that will may be impacted during construction activities, but will be restored (i.e., re-graded and re-vegetated) post-construction. Permanent impacts comprise all areas that will be permanently modified as part of the Project. Table 4, *Summary of Water Bodies*, below provides detail on permanent impact areas.

Project Elements

The San Francisquito Creek Joint Powers Authority (SFCPJA) proposes the Project. This Project would increase conveyance and retention capacity of floodwaters from runoff and extreme San Francisco Bay tides to protect residents and property from flood events along the lower section of the Creek, from East Bayshore Road to the San Francisco Bay. An Environmental Impact Report was approved October 25th, 2012 (http://sfcjpa.org/web/documents/docs/docs-sf-bay-highway-101-project-final-eir/). Work within the project boundary includes the following activities. The project elements are identified in Appendix A, Figure 2.

- Excavating sediment deposits within the channel to maximize ~~conveyance~~ flow capacity.
- Rebuilding levees, degrading levees, and relocating a portion of the southern levee to widen the channel ~~to~~ and thus reduce influence of tides and increase channel capacity.
- Constructing floodwalls in the upper reach to increase capacity and maintain consistency with Caltrans' enlargement of the U.S. 101/East Bayshore Road Bridge over San Francisquito Creek (Caltrans facility).

~~Major~~ Original Project elements include:

- Levee setback and improvements to widen the channel and increase levee height and stability between East Palo Alto and the Palo Alto Golf Course.
- Floodwalls in the upper reach downstream of East Bayshore Road.
- Extension of Friendship Bridge via a boardwalk across new marshland within the widened channel.

Since the submittal of the January 28, 2014 Supplemental Application Materials to the Water Board, the SFCJPA has modified the Project in three substantive ways:

1. **Faber Tract levee stability improvement** – Fill will be added to the Faber Tract Levee to reduce concerns regarding levee erosion and the potential for mass levee failure. Raising the lowest levee crest elevation downstream of Friendship Bridge from a minimum elevation of 11 feet to 13 feet, and incorporating a 6H:1V levee side slope into the Faber Tract marsh. The 6H:1V levee side slope will help protect the levee toe from erosion due to flow overtopping over a 400 foot distance as it transitions to a higher elevation (as part of the Original Application), as the levee transitions upstream to a higher elevation (as part of the Original Application) closer to the Bridge. The new area of impact from the existing levee toe to the proposed levee toe is approximately 0.42 acres (18,383 square feet).

2. **Bay levee degrade** - Downstream of Faber Tract, in a marsh area that is subject to daily tides from the San Francisco Bay, a levee degrade will remove approximately 600 feet of the existing levee (STA 3+50 to 9+50). This will further connect the marsh from creek and decrease the water surface elevation during large flood events, allowing the channel to expand out over the marsh area at a point further upstream than under existing conditions.

3. **Rock Slope Protection (RSP) Reduction** - Proposed rock-slope levee protection (RSP) will be reduced by 1.61 acres (70,171 square feet) from what previously proposed, resulting in a new RSP area total of 5.86 acres. The 1.61 acres will be replaced with vegetative levee protection and turf reinforcement mat that will provide soil stabilization and habitat improvements.

Table 2. Summary of Project Elements

Project Component	Description
Levee and floodwall construction	
Levee raising and widening on right bank	From the existing Friendship Bridge to approximately 0.25 mile downstream of Friendship Bridge, between the Creek and Faber Tract.
Levee raising on right bank	Raising and strengthening the levee from the O'Connor Pump Station tie-in near Friendship Bridge to the floodwall.
Levee degrade	Just upstream of the Creek's confluence with the San Francisco Bay.
Floodwall on right bank	The right floodwall would extend from just downstream of Daphne Way to the end of the Project reach where it would connect with the Caltrans U.S. 101/East Bayshore Road facility.
Levee raising on left bank and levee relocation	A new stronger and taller ~~Levee relocation of the middle reach and a small portion of the upper and lower reaches. The levee~~ levee would be relocated inland (currently occupied by the Golf Course), creating space on the ~~left~~ south bank for a marshplain terrace. Except for a section around the eastern footings of Friendship Bridge, the existing levee along this stretch would be removed. Trails that would also act as maintenance roads would be constructed on top of the levees and behind the floodwalls.
Floodwall on	The left floodwall would extend from ~~the end of the left levee~~ just downstream

Project Component	Description
left bank	of Geng Road, along the streambed, around the Palo Alto Pump Station, to the end of the Project reach where it would connect with the Caltrans facility.
Downstream access road on right bank	The right bank downstream access road would be approximately 16 feet wide and extend from the crown of the right levee to street level to just downstream of Daphne Way.
Upstream access road on right bank	The right bank upstream access road would be approximately 12 feet wide and would extend from just downstream of Verbena Drive to the Caltrans facility at East Bayshore Road.
Access road on left bank	The left bank access road would be generally 12 feet wide and would extend from a point downstream of the International School of the Peninsula to the Palo Alto Pump Station. The access road would also be used as a public trail within the City of Palo Alto and would connect to the Baylands Athletic Center.
Friendship Bridge	The existing Friendship Bridge would be retained and extended as a boardwalk from the retained eastern footing across the new marshplain terrace to the relocated ~~left~~ south bank levee.
Marshplain restoration	
Upstream of Friendship Bridge on right bank	High-marsh and transitional vegetation would be planted from the edge of the Creek channel to the toe of the levee from just upstream of Friendship Bridge to East Bayshore Road.
Left bank	High-marsh and transitional vegetation would be planted from the edge of the Creek channel to the base of the floodwall or the toe of the levee. In this area the marsh would be planted adjacent to the toe of the cut-and-fill area. The marsh would extend from the point at which the new levee would diverge inland from the existing levee to East Bayshore Road.

More detailed information for each project element can be found in Biological Assessment included on the CD's included with the package.

Utility Relocation

Project activities would require relocation ~~or removal~~ of electricity transmission towers and poles; abandonment of existing and construction of new gas transmission lines; and realignment or relocation of sewer lines and storm drains (Environmental Impact Report, Figure 2-4).

Construction

Construction of Project elements would likely occur ~~in two phases~~ over two years. ~~While all Project elements could be constructed at one time if sufficient funding was secured, the two-phase construction methodology is conservatively assumed to be the preferred construction approach. Phase One~~ Construction would begin in ~~2014~~ 2015 starting with utility modification and building the new levee of the south bank outside of the existing levee. Work would progress upstream and be completed by 2016. ~~Construction would begin with building the new levee structure outside of the existing levee, during or after completion of PG&E and EPASD modifications to existing utilities and~~

~~modifications to the PAGC, and would proceed at Friendship Bridge and upstream with the excavation of the channel up to East Bayshore Road being the final Project activity. Phase Two construction of upstream floodwalls and associated maintenance roads would occur once funding was secured.~~

Construction activities would take place between 8 a.m. and 6 p.m. on weekdays, and 9 a.m. and 5 p.m. on Saturdays, in accordance with City of Palo Alto and City of East Palo Alto municipal codes. Final construction permits issued for the Project may place additional constraints on construction timing. Table 2 shows ~~the~~ a concise description of the Project elements~~, when construction on each is expected to begin, construction activities, and construction duration.~~

Table 3. Summary of Construction Methodology, Timing, and Equipment

Project Component	Proposed Starting Date	Activity	Proposed Duration	Equipment
Utility Relocation				
PG&E Electricity Transmission	2/2015<u>5</u>4	Construction of shoo-fly tower at T3	2 weeks	1 pickup 1 four-door pickup 1 2-ton tool truck with air compressor 1 dump truck 1 70-ton crane 1 caterpillar (pile driver) 1 back hoe 1 concrete truck 1 pump truck
	2/2015<u>5</u>4	Tower raises (T1 and T4)	2 weeks (1 week per tower)	
	3/2015<u>5</u>4	New tower construction and demolition of T2	4 weeks	
	4/2015<u>5</u>4	Demolition of shoo-fly	1 day	
<u>East Palo Alto Sanitary District sewer main</u>	<u>4/2015</u>4	<u>Sewer line relocation</u>	<u>6 weeks</u>	<u>1 backhoe</u> <u>1 flatbed truck</u>
PG&E Gas Transmission	4/2015<u>5</u>4	Gas line work	4 weeks	2 4-door pickups 1 backhoe 2 flatbed truck
	4/8/2015<u>5</u>4	directional drilling	2 weeks	1 directional drill rig
	4/18/2015<u>5</u>4	export of material	1 week	2 dump trucks 1 flatbed truck
	4/25/2015<u>5</u>4	concrete	2 days	1 concrete truck
	4/27/2015<u>5</u>4	Demobilization	1 week	2 4-door pickups 1 flatbed truck
Phase One—Levees and Excavation				
Site Preparation	4/2015<u>5</u>4	Mobilization Tree Removal Clearing and Grubbing Stripping Demolition	6 weeks	4 four-door pickups 1 backhoe 1 loader 1 jackhammer 1 flat-bed truck
Construction of new left bank levee	5/2015<u>5</u>4	Site excavation Levee construction Seeding for erosion control	5 weeks	4 four-door pickups 3 excavators 1 backhoe 2 loaders 4–6 dump trucks (20 cy each) 2 water trucks

Project Component	Proposed Starting Date	Activity	Proposed Duration	Equipment
Removal of old left bank levee	7/2015~~5~~4	Site excavation	3 weeks	4 four-door pickups 3 excavators 1 backhoe 2 loaders 4–6 dump trucks (20 cy each) 2 water trucks
Removal of right bank levee	7/2015~~5~~4	Site excavation Relocation of East Palo Alto sewer line and siphon	2 weeks	4 four-door pickups 3 excavators 1 backhoe 2 loaders 4–6 dump trucks (20 cy each) 2 water trucks
Construction of right bank levee	8/2015~~5~~4	Levee construction Seeding for erosion control	3 weeks	4 four-door pickups 3 excavators 1 backhoe 2 loaders 4–6 dump trucks (20 cy each) 2 water trucks
Construction of downstream access road on right and left banks	9/2015~~5~~4	Site preparation and paving	4 weeks	4 four-door pickups 1 dump truck 1 grader 1 four-door pickup 2 concrete trucks 1 asphalt paver 1 compactor
Friendship Bridge	10/2015~~5~~4	Site excavation Boardwalk construction	6 weeks	4 four-door pickups 1 backhoe 1 loader 1 flat-bed truck
Channel widening and marshplain terracing	7/2015~~5~~4	Site excavation Terracing	10 weeks	4 four-door pickups 3 excavators 1 backhoe 2 loaders 4–6 dump trucks (20 cy each) 2 water trucks
Revegetation	10/2015~~5~~4	Installation of irrigation system Revegetation	6 weeks	2 four-door pickups

Project Component	Proposed Starting Date	Activity	Proposed Duration	Equipment
Phase Two—Floodwalls				
Site Preparation	5/2016~~5~~	Mobilization Clearing and grubbing	3 weeks	4 four-door pickups 1 backhoe 1 loader 1 jackhammer 1 flat-bed truck
Installation of right and left bank floodwalls	6/2016~~5~~	Site excavation Preparation of foundation Construction of floodwalls	5 months	4 four-door pickups 1 excavator 1 trencher 1 backhoe 1 loader 1 dump truck 1 grader 2 concrete trucks 1 flat-bed truck
Construction of upstream access road on right and left banks	10/2016~~5~~	Site preparation and paving	4 weeks	4 four-door pickups 1 dump truck 1 grader 1 four-door pickup 2 concrete trucks 1 asphalt paver 1 compactor
Site Restoration	11/2016~~5~~	Demobilization	2 weeks	2 four-door pickups 1 loader 1 flat-bed truck

Marshplain Creation and Restoration

The Project would create approximately ~~15.3~~ 13.59 acres of tidal marsh on both sides of the Creek, effectively restoring tidal influence in the Project reach (see Figure 2). Marshplain creation would span the entire Project extent on both banks from East Bayshore Road to San Francisco Bay on the right bank and from East Bayshore Road to Friendship Bridge on the left bank. Both sides of the channel would be planted from the toe of the levee or base of the floodwall to the edge of the Creek channel.

After ~~Phase One~~ levee construction is complete, the tidal marsh area would be terraced and revegetated with high-marsh plants. The high-marsh planting area would total ~~7.05~~ 7.68 acres and the high-marsh transition planting area would total ~~8.34~~ 7.66 acres. Additionally, in areas where rock slope protection is required, 10-foot vegetated shrub bands would be installed to provide refugia and promote long term vegetated protection and stability across the rock slope protection areas.

Native marsh plants would be used to revegetate the terraced land. Plants appropriate to the high marsh would be planted near the stream channel. Plants native to marsh transition areas would be

planted in areas more distant from the Creek channel. The SFCJPA, or its designated contractor, will be responsible for the acquisition of plant material. All container stock will be propagated from native stock collected within the south San Francisco Bay and tidally influenced creeks in coordination with Santa Clara Valley Water District staff.

Box 19- Mitigation

The SFCJPA is restoring affected tidal marsh, diked marsh, freshwater marsh, and riparian habitat with the proposed enlarged tidal marshplain that would represent a combination of in-kind and out-of-kind mitigation for habitat impacts (see Figure 2). This enhancement will result in the creation of approximately ~~15~~ 13.59 acres of marshplain habitat. ~~Permanently affected habitat will be restored at a mitigation-to-effect ratio of 2:1, and temporarily affected habitat will be restored at a minimum effect-to-mitigation ratio of 1:1.~~ As the restored marshplain will provide habitat of higher quality than is being impacted (including appropriateness to the site, species composition, and contiguous area), the Project proposes that the impacted 11.44 acres of habitat is fully compensated at a 1:1 ratio that is part of the 13.59 acres of restored marshplain.

In-kind restoration options don't exist in the study area if the ultimate goal is to retain the natural functions and values of San Francisquito Creek. Out-of-kind restoration will occur on-site, and will result in a greater net acreage of habitat creation than in-kind, off-site restoration and result in an overall net benefit to the ecosystem. The SFCJPA is ~~developing a~~ has included a Mitigation and Monitoring Plan (MMP) (Appendix E) to ensure that all removed habitat is replaced with native marshplain species to maintain structural complexity and habitat value. The MMP will be completed in the context of the federal and state permitting processes under the Clean Water Act and California Department of Fish and Wildlife Code, and will include success criteria as specified by the permitting agencies. The MMP will also include adaptive management guidelines for actions to be taken if the success criteria are not met.

Box 24: Dredge and Fill Information

Table 4. Summary of Water Bodies

All relevant impact calculations have been updated as a result of project design calculations. Please note that each revised calculation in the table has not been but the new totals are underlined.

Water Body Type	ID	Reason For Action	Amount and Type of Material Cut (CY)	Amount and Type of Material Fill (CY)	Surface Area Affected (P acre)	Surface Area Affected (T acre)
Diked Marsh	DM-1	Levee	0	0		0.15
Diked Marsh	DM-2	Levee	0	0	0	0.01
Diked Marsh	DM-3	Levee	0	0	0.02	0.01
Diked Marsh	DM-4	Levee	0	0	0.000	0.01
Diked Marsh	DM-5		0	0	0	0
Diked Marsh	DM-6		0	0	0	0
Diked Marsh	DM-7	Levee	0	0	0.00	0
Diked Marsh	DM-8	Levee, Pavement, Cut of Floodplain Bench (CFB)	459	11,287	1.33	0
Diked Marsh	DM-9	Levee, Rock(RSP), Gravel	0	1,230	0.18	0.02
Diked Marsh	DM-10	Levee, RSP, CFB	0	2224	0.80	0
Diked Marsh	DM-11	Levee	0	2,301	0.24	0
Diked Marsh	DM-12	Levee	0	1,344	0.10	0
Diked Marsh	DM-13	Levee, CFB	46	607	0.21	0
Freshwater Marsh	FM-1	Levee	0	882	0.19	0
Freshwater Marsh	FM-2	Levee	0	740	0.14	0
Tidal Salt Marsh	TSM-1	Levee, CFB	2,903	1,242	1.50	.26
Tidal Salt Marsh	TSM-3	Levee, RSP, CFB	193	0	0.00	0.00
Tidal Salt Marsh	TSM-4	Levee, RSP, CFB	0	1,216	0.05	0.16
Tidal Salt Marsh	TSM-5	Levee	2	0	0.35	0.33
Tidal Salt Marsh	TSM-6		25	0	0.01	0
Tidal Salt Marsh	TSM-7	Levee, RSP, CFB	83	21	0.02	0.16
Tidal Salt Marsh	TSM-8		0	0	0.14	0.16

Water Body Type	ID	Reason For Action	Amount and Type of Material Cut (CY)	Amount and Type of Material Fill (CY)	Surface Area Affected (P acre)	Surface Area Affected (T acre)
Tidal Salt Marsh	TSM-9	Levee, RSP, CFB	1,106	1,590	0.00	0.42
Tidal Salt Marsh	TSM-10	Levee, CFB	3	0	1.03	0.0
Tidal Salt Marsh	TSM-11	Levee, RSP, CFB	146	64	0.05	0
Tidal Salt Marsh	TSM-12	Levee, CFB	32	0	0.03	0
Subtotal Wetlands			3995	19748	6.38	1.52
Freshwater Pond	FP-1	Levee	0	5,604	1.13	0
Tidal Channel and Bay Waters	TC-1	Levee	0	0	0	0.02
Tidal Channel and Bay Waters	TC-2	Levee, RSP, CFB	342	2,353	0.80	1.59
Tidal Pan	TP-1		0	0	0	0
Tidal Pan	TP-2		0	0	0	0
Tidal Pan	TP-3		0	0	0	0
Subtotal Other Water Bodies			342	2,957	1.93	1.79
PROJECT TOTAL			**4,337**	**35,613**	**8.31**	**3.14**

Rock Slope Protection

As previously mentioned, the new design has resulted in the reduction of approximately 1.61 acres (70,171 square feet) of RSP compared to the Project design as January 28, 2014 Supplemental Application Materials. Please see Appendix A, Figure 2 for the Project Site Plans and Table 5 below. This table also includes gravel and pavement which accounts for the difference in grand totals in Table 5 and the 1.61 acres of rock slope protection.

Table 5. Rock Slope Protection

Row Labels	Values	
	Volume (CY)	Area (sf)
Diked Marsh		
DM 10		
Additional Fill Volume	13.7	184
Rock Slope - 2ft	13.7	184
Subsurface Volume (Requires over-excavation)	369.9	2,699
Levee Toe Rock	369.9	2,699
DM 8		
Additional Fill Volume	87.6	4,732
Pavement	87.6	4,732
Subsurface Volume (Requires over-excavation)	0.6	5
Levee Toe Rock	0.6	5
DM 9		
Additional Fill Volume	8.9	478
Gravel	8.9	478
Tidal Channel and Bay Waters		
TC 2		
Subsurface Volume (Requires over-excavation)	528.5	3,785
Floodwall Toe Rock	46.0	264
Levee Toe Rock	482.5	3,521
Tidal Salt Marsh		
TSM 1		
Additional Fill Volume	1.1	15
Rock Slope - 2ft	1.1	15
Subsurface Volume (Requires over-excavation)	587.2	4,285
Levee Toe Rock	587.2	4,285
TSM 3		
Subsurface Volume (Requires over-excavation)	66.3	381
Floodwall Toe Rock	66.3	381
TSM 4		
Additional Fill Volume	14.7	796
Gravel	14.7	796
TSM 7		
Additional Fill Volume	75.0	675
Rock Slope - 3ft	75.0	675
Subsurface Volume (Requires over-excavation)	535.6	3,909
Levee Toe Rock	535.6	3,909
TSM 9		
Additional Fill Volume	61.9	557

Row Labels	Values	
	Volume (CY)	**Area (sf)**
Rock Slope - 3ft	61.9	557
Subsurface Volume (Requires over-excavation)	683.0	4,984
Levee Toe Rock	683.0	4,984
Non-Wetland		
Non-Wetland		
Additional Fill Volume	6204.0	152,029
Gravel	1186.8	64,086
Pavement	726.8	39,247
Rock Slope - 2ft	2240.5	30,247
Rock Slope - 3ft	2050.0	18,450
Subsurface Volume (Requires over-excavation)	13922.8	90,704
Floodwall Toe Rock	7016.9	40,310
Levee Toe Rock	6905.9	50,395
Grand Total	**23160.7**	**270,218**

Project Information Requested by the Regional Water Board for the New and Revised Certification Application Package

San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project, San Francisco Bay to Highway 101

City of East Palo Alto, San Mateo County, and the City of Palo Alto, Santa Clara County, California

July 31, 2014

Introduction

On July 24, 2014, the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) provided to the San Francisquito Creek Joint Powers Authority (SFCJPA) a letter intended to assist the SFCJPA in preparing a complete application for a CWA § 401 water quality certification (Certification) for the San Francisquito Creek Flood Reduction, Ecosystem Restoration and Recreation Project, San Francisco Bay to Highway 101 (Project) so that the Regional Water Board can expeditiously act on the application.

The July 24 letter listed the documents needed by the Regional Water Board to effectively analyze a project that modifies a water course or has the potential to impact waters of the State.

On March 12, 2013, the SFCJPA submitted an application (Original Application) to the Regional Water Board for Certification of this Project. All of the documents submitted by the SFCJPA – on March 12, 2013, August 1, 2013 and January 28, 2014 – as part of the Original Application are incorporated (either as a new and revised item or by reference) into this New and Revised Application, dated July 31, 2014. For the purposes of this response document, these items are herein referred to as the following:

- March 12, 2013 Original Application Package
- August 1, 2013 LOI Response Letter
- January 28, 2014 Supplemental Application Materials
- July 31, 2014 New and Revised Application Package

This document is intended to provide direction to Regional Water Board staff for locating requisite materials that were submitted as part of the Original Application and will not change. This document will also assist in identifying the materials from past submittals that are being replaced by new materials. This document also provides summary responses to eleven requests in the July 24 letter, which is attached in the July 31, 2014 New and Revised Application Package, Appendix H, Additional Supporting Documents.

Responses to July 24, 2014 Regional Water Board Requests

The format of the following response section reprints in full Regional Water Board requests, both enumerated and otherwise, found in the July 24, 2014 letter. Each complete request, presented in *italics* is followed immediately by the SFCJPA's response without italics. If the SFCJPA response was partially or wholly addressed previously by the SFCJPA, the new response will be succinctly summarized and the applicable previous material will be referenced.

1. *Provide a detailed description of the watershed and an evaluation of local influences on the channel at the Project site and future conditions of the channel that are proposed by the Project. Provide an assessment as to (a) whether or not the channel is experiencing excessive erosion or sediment deposition; (b) whether or not the channel is experiencing headcutting; (c) whether or not the channel shows signs of attempts to develop meanders; (d) and whether the channel banks have sufficient vegetative cover to provide stabilization of the channel at the Project site.*

Response:

Description of the Watershed:

The following materials previously provided include a detailed description of the watershed and anticipated changes resulting from the proposed Project:

- March 12, 2013 Original Application Package: Application Form and Additional Pages Box 12, Box 15, Box 18 and Box 19 and Appendix A, Figures
- August 1, 2013 LOI Response Letter: Figure 2.2 and Attachment A, 95% Plan Set with Cross Sections;
- January 28, 2014 Supplemental Application Materials: Application Form and Addition Pages Box 15, Box 18, and Box 19, Response Letter, and Attachment B, HDR's Hydraulic Analysis Summary: Comparison of Results Between Existing and Proposed (No Degrade) Conditions

Existing Channel Erosion and Sediment Deposition, Headcutting, and Meandering:

Several studies have been conducted to characterize existing channel erosion and sediment deposition, headcutting, and meandering along the Creek, which help us understand how the project may affect these processes. Several of these studies are shown in January 28, 2014 Supplemental Application Materials, Appendix H, Additional Supporting Documents.

Under current conditions, the existing levees are undersized and the inboard slopes are steeper than would be recommended for slope stability and prevention of toe and levee face scour, and thus large flow events erode the existing levees. As a result of the 1958 trapezoidal channel geometry design that incorporated a flat channel invert bordered on each side by 1:1 inboard slope levees, much of the Project reach has seen fluvial sediment deposited on the inside levee face of channel bends, and scour on the outside levee face of channel bends. Sediment deposition has reached equilibrium, and the channel within the Project reach experiences additional periodic sediment deposition as a response to large events, but those occasional "new" deposits quickly degrade as the larger events recede and the creek reestablishes typical tidal and fluvial influences. Scour on the outside of bends does not recover after large events, and this erosion of the banks has led to the currently unstable levees on both sides of the creek.

The design reach from San Francisco Bay to Hwy 101 is in tidal area. The low flow channel size between marshplains are influenced mainly by how much tidal volume (tidal prism) going through the reach, rather than the sediment inflow to the reach. Under the design condition, the tidal prism under the MHHW level is kept almost the same as the existing condition, therefore, the low flow channel of the design reach is expected to continue the current shape. Historically, the low flow channel may have migrated within the levee limits, but the channel invert has remained stable and is not experiencing sustained headcutting. This is due to the twice daily high tides within the Project reach, and the reestablishment of the Bay muds comprising the channel surface quickly after large events. The channel banks are currently populated by a mix of native and non-native vegetative species, some providing increased levee face stability and some exacerbating erosion during large events, but none of which are typical to the historic marshland environment of the channel reach.

The marshplains elevation has been designed at the Mean Higher High Water (MHHW) level. South Bay marshplains reach stability when the elevations are at MHHW levels. Therefore, the current design marshplains will be stable and no significant sediment depositions are expected to be deposited after the project.

Vegetative Cover to Provide Stabilization of the Channel at the Project Site:

The future conditions which are changed since the original submittal include the cited reduction of rock slope protection and the replacement of rock slope protection by a substantially reduced area of turf reinforcement mat. These two modifications have resulted in an increase of vegetation area. The reduction in rock slope protection will allow for additional marshplain planting (13.59 acres in total) and the turf reinforced mat will be hydroseeded. The downstream relocation of the maintenance road adjacent to the City of Palo Alto Pump Station leaves the City's existing mitigation area undisturbed.

The Bay Levee degrade reconnects the creek mouth to the existing outer marsh, increasing the area of contiguous marshplain and providing better interaction between the riparian system and the bay.

Filling the upstream low point on the Faber Tract levee requires an additional 6H:1V earthen slope to be placed at the levee toe within the marsh in order to stabilize that slope during overtopping. This extra fill will provide the opportunity to increase habitat value and escape cover for the listed threatened and endangered species within the Faber Tract. Although a small amount of lower marsh habitat will be reduced, there will be higher marsh and transitional habitat gains which are critical refugia habitat for the salt marsh harvest mouse and clapper rail during high tides and high flows. The South Bay Salt Pond and Shoreline Project studies have documented that once sea level rises, it is going to be these transitional habitat areas that are critical to the survival of these species. The slopes will be revegetated with appropriate vegetation to provide this important habitat.

2. *Provide an evaluation of the sediment discharge balance of the watershed and if the Project may improve or destabilize sediment equilibrium in the watershed. In assessing the potential impacts of the Project, the JPA should determine how the Project as proposed will function to capture additional sediment as the watershed's hydrology is modified upstream by future flood control projects that will deliver more discharges and sediment to the lower reaches of San Francisquito Creek. The Project design should have sufficient flexibility to accept more sediment from the Searsville Dam portion of the watershed, as the dam is either removed or modified in the future, and/or as water spills from the presently mostly full reservoir to the downstream portion for the watershed. As the Project is located at the lowest end of the watershed with lower gradient, it may provide a significant sediment storage function, and the Project's design must anticipate this storage function. In order to accommodate this future sediment storage function, the basis of design for the Project must address both its marsh plain features and, potentially, its floodplain features for accumulating sediment.*

Response:

Existing Sediment Discharge Balance of the Watershed:

Previous studies indicate that the creek is lowering its slope by incising from Sand Hill Road to Pope/Chaucer Street and by depositing sand and fine gravel on the bed downstream from Pope/Chaucer Street to the delta. The incision is assumed to result from slope adjustments that are a response to the capture of coarse sediment from Corte Madera and other creek inputs into Searsville Lake and also from increased peak flows from surrounding development. Rates of incision have been quite slow, averaging about 0.012 feet/year from 1964 to 1998 (1.2 feet per century), and seem to be nearly negligible since 1998. Active bank erosion is concentrated in the reaches that are incising. [According to the Geomorphic and Sediment Yield Analysis (NHC 2010) provided in July 31, 2014 New and Revised Application Package, Appendix H, Additional Supporting Documents].

Searsville will fill in at some point in the future (recent estimates range from one to four decades), which will increase the volume and caliber of sediment contributed to the San Francisquito Creek. Regardless of the final future outcome at Searsville Lake, continued incision and lowered flood levels upstream of Pope/Chaucer Street and continued aggradation and raised flood levels downstream of Pope/Chaucer Street are expected. The total changes in flood levels in the Creek are expected to be minimal because the sediments that pass through Searsville Lake over a fifty-year horizon are fine-grained sand, silt, and clay. These sediments are not part of the bed material load and pass through the upper part of San Francisquito Creek and are ultimately deposited downstream of Hwy 101, on the delta, or carried to the Bay. [According to the Geomorphic and Sediment Yield Analysis (NHC 2010) provided in July 31, 2014 New and Revised Application Package, Appendix H, Additional Supporting Documents].

Potential Project Impacts on Sediment Equilibrium in the Watershed:

The Project has been designed so that the creek can contain an extremely high flow concurrent with a very high tide and Sea Level Rise, with the required freeboard to remove properties from the creek's FEMA floodplain. The freeboard required for meeting FEMA standards takes in to consideration future conditions that may impact a Project's ability to provide the desired level of flood protection, such as channel obstructions, changes in upstream hydrology, changes to the modeled downstream boundary condition, or changes in bed elevation. This flexibility afforded by the Project is in part based upon the quantities of sediment that can foreseeably reach the Project area. The impacts of future, and as yet undefined, proposals that may change the watershed's sediment regime must be analyzed at the time those proposals are put forward and must then be mitigated by those future projects.

How the Proposed Project Will Function to Capture Additional Sediment:

While the position of the Project reach within the watershed may suggest that it could provide a sediment storage function, the Project has been designed to foster the purging of upstream fluvial sediments through the establishment of a stable low-flow channel, flanked by marshplain terraces graded to 1% from the inboard toe of the new levees to the low flow channel. This channel configuration will direct subsiding flows towards the center of the low flow channel, where established velocities will purge suspended sediments through the project reach and to the Bay rather than be deposited in the Creek. For channel configurations, please see the Original March 12, 2013 Application Package, Appendix A, Figure 6 (Engineered Drawings) and the New and Revised July 31, 2014 Application Package, Appendix A, Figure 6 (Revised Engineered Drawings.)

3. *San Francisquito Creek is a significant steelhead watercourse. Accordingly, the application must include an evaluation of how the Project may affect steelhead migration in low and high water scenarios. The JPA's initial application was silent on the needs for steelhead migration except for avoidance of impacts during construction. The potential need for high velocity refuges, channel shading, or other habitat needs still needs to be described in the application and coordinated with the California Department of Fish and Wildlife (CDFW) and the U.S. National Marine Fisheries Service (NMFS).*

Response:

The Project reach encompasses a short migratory corridor for steelhead at the interface between the creek and the Bay. Adult steelhead making their way to the creek mouth from San Francisco Bay during their upstream spawning migration typically will stage just beyond the mouth to the Bay, waiting for appropriate flow conditions to begin the first leg of their migration upstream. Under current conditions, adult steelhead can begin this leg of their migration during most early winter flows. This would be the case during historic conditions, and will be the case post project. Very large flows that produce velocities that prevent active upstream migration of adult steelhead will cause them to wait for lower flows before entering the system. It is not anticipated that adult steelhead would be present during high flow events in the project reach and therefore high velocity refuges are not necessary. High velocity flows typically subside within a few hours or days, allowing for successful upstream adult migration. Since both upstream migrating adult steelhead and downstream migrating smolt spend very little time in the project reach, channel shading is not necessary. Refer to July 31, 2014 New and Revised Application Package, Appendix H, Additional Supporting Documents Lower San Francisquito Creek Watershed Aquatic Habitat Assessment and Limiting Factors Analysis for more information.

4. *In January 2014, we expressed concern that the Project calls for "excavating sediment in the existing channel to maximize conveyance." The Project as proposed at that time would create a new low flow channel below existing grade from station 44+00 to 55+00 (a distance of over a thousand feet). The current channel is most likely "graded" or stable at its current elevation. One of the greatest engineering legacy errors in Bay Area flood control designs is to design a channel gradient that is not sustainable. Selecting geomorphically-appropriate dimensions and elevations for a channel are critical to attaining effective sediment transport and sustaining the design channel capacity. The application must describe the basis of any proposed low flow channel designs below existing grade, such as was proposed between*

stations 44+00 to 55+00. The Checklist contains a series of questions on the basis of design for channel features, including a low flow channel, a marsh plain, and/or other terraces. The application should include cross-sections with elevations and profiles of the low flow channel, marsh plain, and floodplain. The elevation changes over distance help to inform the development of feasible creek channel revegetation projects.

Response:

Basis of Proposed Low Flow Channel Designs

Sediment to be excavated in the existing channel to maximize conveyance is limited to fluvial deposits that have aggraded throughout the project reach above the elevation of daily tidal influences. The elevation of the channel invert is stable and will not be changed by the project. A relocated low flow channel is proposed from stations 44+00 to 55+00 due to its too close of proximity to the proposed inboard levee toe. This low flow channel was sized appropriately to mimic the existing low flow channel geometry both upstream and downstream of the relocation segment. The low flow channel for the remainder of the project length is not being impacted, therefore, it is anticipated that the low flow channel will continue as a self-maintaining channel allowing tidal action to reach up to Highway 101 almost on a daily basis. It is also anticipated that the low flow channel will be allowed to meander, as it does in the existing condition, between the levees and floodwalls. The Operations and Maintenance Manual (New and Revised July 31, 2014 Application Package, Appendix F, Project O&M Plan) requires periodic inspections of the channel to evaluate status of the channel and concerns for potential erosion. If issues with the low flow channel arise, repairs or mitigation will be dealt with on a case-by-case basis as part of on-going operations and maintenance.

For cross-sections with elevations and profiles of the low flow channel, marsh plain, and floodplain, see July 31, 2014 New and Revised Application Package Appendix A, Figure 6 (Engineered Drawings). Previously provided design plans also show that the channel invert will not be changed as part of the Project (see the Original March 12, 2013 Application Package, Appendix A, Figure 6 (Engineered Drawings), Page C14 in the Plan Set).

5. *The application should describe the expected low as well as high flows for the 2-, 5-, 10-, 50-, and 100-year recurrence intervals. This information is necessary to determine conditions for fish migration as well as plant establishment. Depths of flow should be provided in cross-sections for the different recurrence intervals. These depths of flow, along with channel slopes, are then used to compute shear stress in pounds per square foot. Shear stress can be an output provided by the HEC-RAS model being used. Both velocities and shear stress values at these different flows should be provided to determine the basis for vegetative or rock cover of the levee side slopes. This information is also necessary for NMFS and CDFW to evaluate potential Project impacts and design features necessary for steelhead.*

Response:

Instead, lower events were quickly evaluated to determine worst case erosion conditions. It was determined that the 100-year flood event with a very low tide would cause the highest channel and overbank velocities and shear stresses, therefore, erosion protection measures were sized with this event. The elevation of the channel invert is stable and will not be changed by the project, although the low flow channel from stations 44+00 to 55+00 will be relocated away from the proposed inboard levee toe. As this low flow channel will remain essentially the same post-project, migratory fish will have the same opportunities to pass through the reach under all flow scenarios. Channel and overbank velocities and shear stress has been provided as an output from the HEC-RAS model used in development of the project design. Fish migration, as described in the response to item 3 above, is not impeded by periodic high flows through the project reach as adult steelhead typically do not enter the system during these brief events.

Vegetative areas will be created along levee slopes to provide refugia and promote long-term vegetated protection and stability. =The rock/hardscape has been limited to where required by velocities, but appropriate marsh vegetation is included at all other locations.

6. *The JPA has submitted a geotechnical analysis that evaluates the potential for levee settling and addresses both "primary and secondary" settlement projections for the levees underlain by soft compressible bay mud. The analysis is focused on the Palo Alto Golf Course levee and estimates a short term or primary settlement of 18 inches over approximately two years. The East Palo Alto levee only discusses a long term "secondary" compression. We assume there will be a newly aligned levee constructed on the East Palo Alto side and that both short and long term levee subsidence would be part of the design considerations. The application should provide a detailed geotechnical analysis for the East Palo Alto levee including "primary and secondary" settlement projections.*

Response:

The levee on the East Palo Alto side will be improved but will not be realigned. Primary settlement will not be a factor as the improved levee on the East Palo Alto side will be built on soils (soft compressible Bay Mud deposits) that have long bourn the weight of the existing levee. GEI, the geotechnical engineer of record for the project, has provided a memo that discusses the anticipated settlement of the project levees and the recommended design elevations to accommodate settlement on both sides of the creek. Please refer to the New and Revised July 31, 2014 Application Package, Appendix H, Additional Supporting Documents, Levee Settlement Letter for more information.

7. *Some of the Project's features have changed since the initial application. The new application should include a complete detailed description of the proposed channel dimensions of each Project feature including the total size (in acres), length (in feet) where appropriate, type, and description of the entire Project area, including areas outside of waters of the State. This description shall include channel dimensions for each Project feature including, but not limited to, (a) channel bed and bank; (b) channel slope; (c) levee heights and slope; and (d) levee widths (top and base).*

Response:

The primary project features that have changed since the original application pertain to design features along the Faber Tract levee on the northern border of the creek downstream from Friendship Bridge, a levee degrade at the San Francisco Bay outlet, and an overall reduction of rock slope protection. These changes are described in the New and Revised July 31, 2014 Application Package (Application Form and Additional Pages, Box 15 and Appendix A, Figures 2 and 4). The proposed channel dimensions of each Project feature are shown in New and Revised July 31, 2014 Application Package (Application Form and Additional Pages, Figure 6, Revised Engineered Drawings).

8. *For each habitat type impacted by the Project, provide the total estimated quantity (both in linear feet and acres) of waters of the State that may be adversely impacted temporarily or permanently by a discharge or by dredging. This should also include the quantity of waters to be impacted by any dredging or fill activities in cubic yards. Provide a map and figures to scale identifying the location, dimensions (in acres, linear feet, height, width) for each project feature.*

Response:

Impacts of the project are described quantitatively, by water body type in the July 31, 2014 New and Revised Application Package, Additional Pages, Table 4 and Appendix A, Figure 4. Water body types are identified as diked marsh (DM) wetland, freshwater marsh (FM) wetland, tidal salt marsh (TSM) wetland, freshwater pond (FP), tidal channel and bay waters (TC), and tidal pan (TP). Discussion on habitat types associated with each water body is provided in July 31, 2014 New and Revised Application Package, Additional Pages, Table 4 and Appendix E, Mitigation and Monitoring Plan.

The Project will result in 8.31 acres of permanent impacts and 3.14 acres temporary impacts, for a total of 11.44 acres of impacts to waters of the state. Permanent impacts comprise all areas that will be permanently modified as part of the Project, such as those associated with earthwork (i.e., excavation and fill) and O&M areas (i.e., new roads and O&M work areas). Temporary impacts include areas that will may be impacted during construction activities, such as staging and stockpiling areas, temporary access roads, and re-established revegetated areas, but will be restored (i.e., re-graded and re-vegetated) post-

construction. Table 4, Summary of Water Bodies, below provides detail on permanent and temporary impact areas.

9. *Mitigation and Monitoring Plan (MMP): The application must include a detailed alternatives analysis describing how impacts to waters of the State will be avoided and minimized. The MMP must include a detailed description of compensatory mitigation for unavoidable impacts to waters of the State. The proposed mitigation must meet the goals of the California Wetlands Conservation Policy (Executive Order W-59-93; No Net Loss Policy; as described in Section 4.23.4 of the Basin Plan) to achieve no net loss and a long-term net gain the quality and quantity of stream and wetland resources. The Regional Water Board considers the following factors in determining the amount and type of mitigation required: (a) the type of compensatory mitigation (e.g., whether the mitigation is in-kind and/or onsite); (2) comparison of the aquatic resource functions lost at the impact site and the functions expected to be provided by the mitigation project; (3) temporal losses of aquatic resource functions (i.e., functions lost due to the passage of time between loss of the impacted aquatic resource and creation/restoration of the full-functioning mitigation); and (4) the difficulty, uncertainty, and likelihood of success of mitigation. The MMP, at a minimum, must include methods for restoring and enhancing tidal marsh habitat, reestablishing native riparian vegetation, removing invasive plant species, and success criteria and monitoring methods based on the following:*

    a. *Tidal Marsh Habitat and Riparian Re-vegetation: The JPA's recent Project design materials describe the creation of new high marsh next to the channel and a "transition marsh" further from the channel. Earlier application materials described the creation/enhancement of new high marsh of 5 species next the channel and a "transition marsh" of 8 transition marsh species further from the channel. Most existing riparian trees are proposed for removal from the site and some mitigation riparian plantings in the southwest portion of the Project are impacted.*

       The MMP should describe (1) Project environmental conditions appropriate to support the proposed marsh habitats; (2) appropriate elevations for (a) low marsh habitats, which occur from approximately mean sea level to mean high water; (b) middle marsh habitats, which occur from approximately mean high water to mean higher, and (c) high marsh habitat and water zones, which occur near and above mean, higher, high water. Elevations for these zones should typically be shown on the design plans and in cross sections. This level of detail is critical for assuring success for a marsh creation objective because the plant species must be carefully matched with their elevations in the marsh.

    b. *The MMP should identify impacts to each habitat type and describe the methods and location in which each impacted habitat type will be compensated through preserved, enhanced, created, or restored mitigation habitat (habitat enhancement is generally required to compensate for temporary impacts, while habitat creation/restoration is required to offset permanent impacts to wetland habitat).*

    c. *The total quantity (in acres and linear feet) of mitigation habitat, by habitat type proposed to be preserved, enhanced, created, or restored should be described. If compensatory mitigation is to be provided in some other form, that must be explained. The MMP must also include drawings identifying the location of each habitat type to be preserved, enhanced, created or restored, and identify elevation markers appropriate for each habitat type and location.*

    d. *To determine whether a site provides appropriate conditions for passive reestablishment of tidal areas, a sediment budget for the site needs to be created to ensure that appropriate marsh elevations will be maintained during the plant establishment period and the foreseeable future. This sediment budget will need to include both fluvial and offshore sediment inputs and include an evaluation of erosion due to fluvial shear stresses. There is a threshold value for suspended sediment to sustain tidal marsh types. The upland transition plant community requires active restoration work and the proposed plan should address the 30 species in use in restoration as well as the use of seeding techniques. The fluvial system can build the high marsh with alluvium. Given the likelihood that more sediment will be transported downstream, it would be prudent to address the possibility of providing*

for a floodplain above the marsh plain. NMFS and CDFW should be consulted regarding what the planting plan should provide and the recommended species from the fisheries perspective.

e. *Monitoring Methods: The MMP should also describe proposed monitoring methods, including, but not limited to, (1) an assessment of hydric soil indicators annually for five years at a minimum of six locations within the restored areas, (2) an assessment of sediment deposition and erosion annually for five years, measured with topographic surveys at permanently established transects at a 100-meter interval, (3) an assessment of channel morphology in each re-established or re-habilitated tidal channel annually for five years, measured with topographic surveys at the channel mouth and every 100 meters upstream, (4) a qualitative hydrologic assessment of the restored and enhanced tidal marsh habitat annually for five years to determine the presence of unobstructed versus restricted exchange of tidal waters, and (5) a Corps-verified wetland delineation in Year 5 to confirm that the mitigation acreage and success criteria requirements have been met.*

Monitoring should include a combination of photo documentation from at least six fixed points and estimations of absolute cover using transects, quadrants, or another quantitative method. Performance criteria should include minimum cover of native riparian vegetation and maximum cover of highly invasive non-native species listed in Tier 1 of the Regional Water Board's Fact Sheet for Wetland Projects. The Fact Sheet can be obtained at http://www.waterboards.ca.gov/sanfranciscobay/certs.shtml or by contacting Regional Water Board staff at (510) 622-2300.

Response:

The Project would create approximately 13.61 acres of tidal marsh on both sides of the Creek, effectively restoring tidal influence in the Project reach. After levee construction is complete, the tidal marsh area would be terraced and revegetated with high-marsh plants. The high-marsh planting area would total 5.93 acres and the high-marsh transition planting area would total 7.68 acres.

The mitigated marsh will provide higher quality wetlands than those existing, and to function more like historical wetland conditions in the area. For example, included within the Project's impact mentioned previously are 0.82 acres of wetlands (waters of the state) on existing Palo Alto Golf Course lands. These are low quality, minimally functional, and isolated. The restored marshland will have far superior functions and values and provide high quality species' habitat.

The Project EIR (March 12, 2013 Original Application Package, Disc 1) and previous submittals discuss other alternatives (August 1, 2013 LOI Response Letter, Attachment G, San Francisquito Creek Flood Reduction Alternatives Analysis) considered and how the proposed Project is the least environmentally damaging practicable alternative (LEDPA).

The Revised Project MMP (July 31, 2014 New and Revised Application Package, Appendix E) details the quantity and quality of waters impacted by the Project. The Project plans show the locations of high marsh and transitional marsh plantings, approximately 19,600 plants and cuttings are planned for installation based on the elevation of the marshplain at mean higher high tide and transitioning to the base of the levees and floodwalls. The MMP includes monitoring methods, success criteria, maintenance including invasive plant removal, and reporting requirements.

The restoration will be done by active planting at the design elevations. No passive reestablishment is proposed and the revegetation does not rely on the need for sedimentation. The species to be planted in the high marsh and transition zones were selected based on their appropriateness to the Projects location at the Bay's edge.

The monitoring program includes qualitative and quantitative monitoring of wetland vegetation and the channel including annual photo-documentation and a wetland delineation after Year 5 (See the New and Revised July 31, 2014 Application Package, Appendix E, Mitigation and Monitoring Plan).

10. *Maintenance Plan: The Regional Water Board typically requires a long-term maintenance plan as a condition of certification. The maintenance plan is as much a part of the Project's design as the features constructed by the Project, since maintenance activities may have significant impact on aquatic habitat and the species that rely on that habitat. Based on our review of the channel dimensions previously proposed, the lower channel invert would quickly become filled with sediment and require regular maintenance dredging to maintain the channel design capacity. Rather than committing the JPA to ongoing channel dredging, Regional Water Board staff encourage the JPA to revise the design floodplain elevations to be set at higher elevations, so that sediment deposition can occur over time. This design revision would avoid regular, environmentally disruptive and expensive maintenance dredging. Since the Project is located in two counties, the specific parties responsible for maintenance should be identified.*

Response:

The channel invert will not be significantly altered or lowered by the project from the existing condition. Dredging of the low flow channel is not currently required since the channel is self-maintaining, therefore, it is anticipated that regular dredging will not be required in the future. Please see the Response to Item 4, above, for more detail. A draft Operations and Maintenance manual is being submitted with this Revised Application. Channel elevation will be evaluated as part of the required periodic inspections and will be dealt with on a case-by-case basis as part of on-going operations and maintenance (see the New and Revised July 31, 2014 Application Package, Appendix F, Project Operations and Maintenance Manual).

Historical aerial imagery dating back to as far as 1948 was also reviewed for channel behavior. It is unknown how flow profiles have changed over these years, however, the general channel alignment has remained fairly constant. The reference, Fluvial Forms and Processes, by Knighton, was considered when evaluating the tendency of channel meandering. It has been estimated that SF Creek is in the transition area between meandering and straight channels which indicates a relatively low risk of meander migration into the floodwalls or levees in the system. This assumption, however, does not decrease the amount of operations, maintenance, and monitoring that should be performed as part of the maintenance plan (New and Revised July 31, 2014 Application Package, Appendix F, Project Operations and Maintenance Manual).

11. *The application should address water quality impacts related to urban stormwater runoff into the creek and the adjacent Faber Tract Marsh habitats. Increase in flow would also increase the loads of urban runoff pollutants, such as trash, pathogens, heavy metals, pesticides, petroleum hydrocarbons, fertilizers, and other pollutants of concern, into sensitive endangered species marsh habitat. The application should include a proposal to implement effective measures designed to improve water quality both upstream and within the Project reach by reusing, detaining, infiltrating, and treating urban runoff.*

Response:

The Project does not increase flow going to San Francisco Bay; it simply redirects it for improved water quality. During large flow events the channel overtops its banks and floods adjacent urban land uses. This floodwater picks up urban pollutants before being pumped back into the channel to flow into San Francisco Bay. With the Project, large flow events, up to the 1-percent storm event, will be contained within the channel and not pick up additional urban pollutants.

As compared to existing conditions, the Project reduces the frequency, volume, and velocity of flow into the Faber Tract marsh; therefore there is no change to water quality entering the Faber Tract. Most pollutants are removed during the 'first flush'. The first flush will continue to be released to San Francisco Bay as under existing conditions. The Project will improve water quality because stormwater going to the Bay will be filtered by a new 15-acre marshplain terrace within the widened creek channel as opposed to the existing conditions where water overtops the channel at the upstream end of the Project reach and flows over streets and through homes, businesses and garages before being discharged to the Bay. As agreed to with the Regional Water Board Executive Officer on March 19 2014, this Project does not impact water upstream of the Project reach, which would be the subject of future projects and permits affecting the watershed.

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