San Francisco Bay Conservation and Development Commission
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Application Summary
(For Commission consideration on November 20, 2014)

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Summary

Applicant: U.S. Fish and Wildlife Service (USFWS)

Location: The 400-acre project site is located in the Bay and within the 100-foot shoreline band along the western bank of the mouth of Sonoma Creek, within a large, fringing tidal marsh in the San Pablo Bay National Wildlife Refuge. The site is south of Highway 37, in an unincorporated area of Sonoma County (Exhibit A). The project area is bordered by San Pablo Bay to the south, Sonoma Creek to the east and Vallejo Sanitation and Flood Control District property to the north (Exhibit B).

Project: The proposed project is a collaboration of the San Pablo Bay National Wildlife Refuge, Audubon California (Audubon) and the Marin Sonoma Mosquito Vector Control District (the District) to reduce mosquito production, improve the health and vigor of an existing tidal marsh by enhancing tidal circulation and drainage for a 284-acre section of marsh, and to increase the diversity of existing habitats within the marsh by constructing marsh mounds and upland refugia for wetland dependent species. Following spring tides and storm events, water routinely ponds in the marsh and is retained for long periods due to variable site elevations and insufficient channels. The ponded water leads to high mosquito production and reduced vigor and in some cases, drowning of tidal marsh vege-

tation. These impacts to salt marsh vegetation results in a reduction in habitat value for special-status species, such as the California clapper rail and the salt marsh harvest mouse.

The project involves improving tidal circulation in the marsh by constructing a central tidal channel (connecting the marsh to San Pablo Bay and lower Sonoma Creek) and a series of small tidal channels, as well as filling and raising low-lying ponded areas to marsh plain elevation to improve drainage. The dredged material would be used to create marsh mounds adjacent to the central channel and to raise the elevations of depressed areas inland of a relic berm (high marsh lifts) (a total of 217,800 square feet (5.00 acres)) at elevations that would support tidal marsh vegetation. Additionally, 24,200 cubic yards of dredged material would be placed to construct a 10-acre (436,000 -square-foot) habitat ramp transitioning from marsh plain elevations to upland elevations. The elevation of the ramp would be from 0.001 foot to as much as two feet above existing grades, would have a three percent slope, and would provide refuge habitat for marsh-dependent wildlife during extreme high tides and storm events. At its lowest reaches, the ramp is expected to be colonized by typical tidal marsh vegetation, graduating at its upper elevations to vegetation associated with infrequent tidal inundation, a mix of native vegetation and large woody on-site debris that would increase habitat complexity (Exhibits C through E). Approximately 9,115 cubic yards of the 33,630 cubic yards of material generated from excavating the new channels (27 percent) would be used by the Vallejo Sanitation District to strengthen and raise the perimeter levee. Placement of dredged material on the District's levee has been previously approved by the Commission under BCDC Permit No. M1994.025.

The project would result in the creation and enhancement of 12,155 linear feet of tidal channels (9.42 acres), improving habitat quality and function of the surrounding 283.82 acres of tidal salt marsh habitat. A 10-acre habitat ramp (AKA horizontal levee) would also be created to provide upland refugia for bay

wetland animal species, as well as an area for marsh transgression (the retreat of marsh to higher inland areas with sea level rise). As an approximately three acre portion of the ramp would be built higher than areas currently supporting tidal wetland vegetation, there would be an approximate three acre net loss in tidal marsh habitat as a result of the project.

Table 1. Habitat Conversion with Project Implementation

Description	Material Dredged (cubic yards)	Dredged Material Placed (cubic yards)	Total Area (square feet)	Total Area (acres)
Tidal Channels	43,370	--	191,535	4.40
Marsh Mounds	--	4,865	87,120	2
High Lift Areas	--	2,500	130,680	3
Habitat Ramp	--	24,200	435,600	10
Levee Top *	--	9,115	25,000	0.58

*Placement of dredged material limited to 10,000 cubic yards over 2,500 linear feet has already been approved under BCDC Permit No. M1994.025.03

The levee adjacent to the marshlands that are the subject of this permit are owned by the Vallejo Sanitation District (District). The District has stated that public access along the levee is inconsistent with their adjacent bio-handling operations. For this reason, the USFWS has proposed off-site public access along a 1,400-foot-long section of levee separating the Sonoma Baylands restoration site (authorized in BCDC Permit No. M1991.061) and the Sears Point restoration site (authorized in BCDC Permit No. M2012.022), located 3.8 miles west of the project. The public access would consist of an approximately 1,400-foot-long, 10-foot-wide trail with interpretative signage and seating. The trail would connect existing public access at the Sonoma Baylands site with public access that is currently under construction at the Sears Point project (Exhibit G).

Issues Raised: *The staff believes that the application raises five primary issues: (1) whether the project is consistent with the McAteer-Petris Act and Bay Plan policies regarding fill; (2) whether the project would provide maximum feasible public access, consistent with the project; (3) whether the project is consistent with the Commission's Safety of Fills and Climate Change policies; (4) whether the project is*

consistent with the Commission's natural resource policies, including Fish, Other Aquatic Organisms and Wildlife; and Tidal Marshes and Tidal Flats; and

(5) whether the project is consistent with the Commission's dredging policies.

Background

The project site was once part of the open water of San Pablo Bay, bordered by extensive tidal marshes along its shore. In the late 19th century, most of the marshlands were diked (surrounded by levees and drained) for conversion to agricultural use. As a result of gold-mining activities in the Sierra Nevada's, large amounts of sediment traveled down the rivers and streams, entering the Bay and forming extensive mudflats along the Bay's shore. Over time, these areas of deposited sediment grew to create new tidal marshes known as "centennial marshes". As of 2005, the marsh at the mouth of Sonoma Creek was approximately 400 acres and was added to the San Pablo Bay National Wildlife Refuge in 1982 under a 66-year renewable lease agreement with the California State Lands Commission.

Since the 1960's, the Mosquito Abatement District has been treating the marsh for mosquito abatement with EPA-approved larvicides and chemicals. While the quantities and concentrations of chemicals applied for mosquito control are not currently known to cause harmful effects to organisms other than mosquitos, the reduction of pesticide application is preferred from both an environmental health and economic perspective.

The site's current topography consists of a number of small natural channels along the Bay-front margin and a series of small constructed mosquito control ditches ("Central Basin Area"). A series of relic levee berms exist along the western boundary of the marsh and rise to one to three feet above the adjacent marsh plain ("Relic Berm Area"). As the tide rises, water enters the marsh through the small channels and inundates the central basin and depressions between the relic berms. As the tide falls, the existing channel network does not adequately drain the central basin, leading to long-term ponding (up to three weeks) in the basin, and reducing the vitality of most of the tidal marsh plants that live in the area.

Project Description

Project Details: The project proponent, the U.S. Fish and Wildlife Service, describes the project as follows:

In the Bay:

1. Within the "Central Basin Area": (a) dredge approximately 33,630 cubic yards of material to create a 5,700 linear foot, 57-foot-wide (103,673 square feet (2.38 acres)) central tidal channel tapering down to a minimum width of 16 feet at the southern end, (b) dredge approximately 5,700 cubic yards of material to create 2,605 linear feet (23,829 square feet (0.57-acre) of lateral starter and internal connector channels; and (c) if deemed necessary during project monitoring to adaptively manage the site, dredge approximately 2,690 cubic yards of material to create and enhance up to 15,000 linear feet (44,867 square feet (1.03-acre)) of "minor" channels;
2. Within the "Relic Berm Area" excavate 1,350 cubic yards of material to create 3,850 linear feet (19,166 square feet (0.44-acre)) of new and enhanced drainage channels; and
3. Place dredged material as follows: (a) place approximately 4,865 cubic yards of dredged material to create as many as 35 marsh mounds covering a total of approximately 87,120 square feet (2 acres) of tidal marsh; (b) place 2,500 cubic yards of dredged material in 130,680 square feet (3 acres) of ponded areas to raise the elevations of these high marsh ponds (referred to as "high marsh lifts" in the exhibits; and (c) place 24,200 cubic yards of material to create a 435,600-square-foot (10 acres) habitat transition ramp along approximately 3,200 linear feet of the adjoining levee, that would provide transitional and upland refugia habitat.

Bay Fill: The proposed project would involve placing approximately 42,020 cubic yards of dredged material on approximately 653,400 square feet (15 acres) of existing, largely low quality tidal marsh to fill pond bottoms to improve site drainage (3.00 acres), and to create upland tidal refugia (2.00 acres for marsh mounds and 10 acres for transitional habitat ramp). After fill placement, most of the areas filled (approximately 13.2 acres) would be regularly tidally inundated and would be at elevations that support tidal marsh, hence remaining in the Commission's Bay jurisdiction. An approximate three acre portion of the ramp would be constructed above the high tide line and would be designed to support upland transitional and refugia habitat. The entire project is designed to increase the habitat values of the existing marsh by addressing water circulation problems, creating a greater diversity of marsh habitats, and providing high tide refugia.

After plants recolonize areas that would be filled but would still remain at elevations capable of supporting tidal marsh, the tidal marshes at the site would be reduced by approximately three acres, but the habitat values and functions of the remaining 284 acres would be improved (Exhibit E).

Table 2. Fill Areas for the Project

Description	Total Area (square feet)	Total Area (acres
Marsh Mounds	87,120	2.0
High Marsh Lifts	130,680	3.0
Marsh-Upland Transition Ramp	435,600	10.0
Total Fill Placed	**653,400**	**15**

Public Access: Public access does not exist on site, although there are trails on the refuge along Tolay Creek and Lower Tubbs Island, approximately one mile away. The project sponsor's have stated that providing public access at the site is not feasible because they do not own the levee bordering the marsh, because the owner of the levee (the Vallejo Sanitation District) operates a biosolid operation on the inland side of the levee and has stated that they are prohibited by safety considerations from allowing the public in the area, and because public access on the levee could conflict with special-status wildlife. As a principal project goal is to provide high tide refuge for the endangered California clapper rail and salt marsh harvest mouse, USFWS is concerned that public access adjacent to some of the high tide refuge to be created would lessen the value of this element of the habitat improvements. For this reason, USFWS is proposing to construct a 1,400-foot-long trail along a levee that separates the Sonoma Baylands restoration site and the Sears Point restoration site, a connection between existing access provided with the Sonoma Baylands project (BCDC Permit No. M1991.061) and access currently under construction with the Sears Point project (BCDC Permit No. M2012.022) to the Sonoma Land Trust (Exhibits G and H). The trail would be approximately 10-feet-in-width and would contain interpretative signage describing restoration efforts on adjacent sites and the ecological history of the area. A small "bump-out" area along the trail would be created that would contain seating, interpretive signage and a place for viewing. The public access site is located approximately 3.8-miles from the project site at the mouth of Sonoma Creek.

Schedule and Cost: Construction of the project would commence by November 30, 2015, and be completed within two years of project commencement, by November 30, 2017. Following completion of the project, the USFWS would continue to monitor the site over a ten-year period. The total project cost is estimated to be approximately $1,700,000.

Staff Analysis

A. **Issues Raised**: *The staff believes that the application raises five primary issues: (1) whether the project is consistent with the McAteer-Petris Act and Bay Plan policies regarding fill; (2) whether the project would provide the maximum feasible public access, consistent with the project; (3) whether the project is consistent with the Commission's Safety of Fills and Climate Change policies; (4) whether the project is consistent with the Commission's natural resource policies, including Fish, Other Aquatic Organisms and Wildlife; and Tidal Marshes and Tidal Flats; and (5) whether the project is consistent with the Commission's dredging policies.*

1. **Fill.** The Commission may allow fill only when it meets the requirements identified in Section 66605 of the McAteer-Petris Act, which states, in part, that: (a) the public benefits from fill must clearly exceed the public detriment from the loss of water areas, and fill should be limited to water-oriented uses or minor fill for improving shoreline appearance and public access; (b) no alternative upland location is available; (c) the fill authorized should be the minimum necessary to achieve the purpose of the fill; (d) the fill should minimize harmful effects to the Bay including the water volume, circulation, fish and wildlife resources, and marsh fertility; and (e) the fill should be authorized when the applicant has valid title to the properties in question.

   The project would result in the placement of dredged materials (Bay muds dredged on-site during the excavation of tidal channels) on approximately 15 acres (653,400 square feet) of tidal marsh to construct tidal marsh habitat features including marsh mounds, raising pond bottoms (high marsh lifts), and a 10-acre upland/transitional habitat ramp. USFWS determined that this 284-acre marsh was not as productive or valuable as it could be because of poor tidal circulation and the lack of high tide refugia for marsh animal species, and because of the poor tidal circulation at the marsh, the marsh produced high numbers of mosquitoes requiring regular and expensive chemical treatment. All of the proposed work is designed to address these three problems. Tidal circulation would be improved by creating and enhancing 8,300 feet of tidal channels and by filling ponds where water collects and takes several weeks to drain. This improvement in tidal circulation and drainage typically significantly reduces mosquito production. High tide refugia would be created by using the dredged material to create marsh mounds adjacent to the new and enhanced tidal channels and by creating a 10-acre gently sloping ramp (the habitat transition ramp) from the marsh plain to the top of the adjacent levee. Certainly placing the dredged materials within the marsh will reduce cost for disposing of dredged materials. But using dredged materials to raise pond bottoms and create marsh mounds has been done successfully in the Bay before (C1998.011.01) for lower Tubbs Island, BCDC Permit No. M2012.016 to the Coastal

Conservancy to create high tide refugia for the California Clapper Rail at Belmont Slough in the City of Belmont, Cooley Landing in the City of Menlo Park, and Martin Luther King Jr. Marsh, in the City of Oakland). And while habitat transitional ramps have not been proposed within tidal marshes in San Francisco Bay, they have been a design feature in large marsh restoration projects in diked baylands (Consistency Determination No. C2004.005 to the U.S. Army Corps of Engineers to construct Hamilton, and Consistency Determination No. C2005.007 to USFWS for restoring Cullinan Ranch). Such habitat transitional ramps also provide opportunities for marsh transgression with sea level rise (the inland retreat of tidal marsh to adjoining upland areas with sea level rise). There are at least two proposals for creating such ramps within former salt ponds in South San Francisco Bay that will likely come before the Commission in the future.

a. **Alternative Upland Location.** There is no alternative upland location for the project because the purpose of the project is tidal marsh enhancement, restoration and creation for the purposes of providing improved habitat for special-status species and improving public health conditions by decreasing mosquito-breeding habitat.

b. **Minimum Amount Necessary.** Overall the project would result in the placement of dredged material on approximately 15 acres (653,400 square feet) of tidal marsh to create habitat features designed to enhance the productivity, functioning and habitat value of the surrounding marshlands. Dredged material would be placed on approximately 2 acres (87,120) to construct marsh mounds in the "Central Basin Area". The mounds would be elevated 1 to 2 feet above the marsh plain (7.25- to 8.25-feet NAVD88) and would support high marsh vegetation. The mounds would provide habitat heterogeneity within the interior of the marsh and would be no greater than 100 feet long and 25 feet wide. USFWS determined that the amount of fill associated with the mounds was the minimum amount necessary to provide meaningful benefit to marsh dependent wildlife. The original project design called for five acres of marsh mounds, however this design was revised to reduce fill in the marsh.

   Dredge material would be placed on approximately three acres (130,680 square feet) of tidal marsh to raise the elevation of low lying areas behind a relic berm to improve tidal circulation and drainage (referred to as "high marsh lift areas in the "Relic Berm Area" in Exhibit D). The lifts would be no higher than mean higher high water (6.4 feet NAVD88). It is anticipated that the lifts would vegetate with high marsh vegetation within two years following completion of construction. The USFWS states that the area and volume of fill associated with the lift areas represent the minimum amount of material needed to improve drainage conditions within the "Relic Berm Area" and provide areas that would support high-marsh vegetation.

   Placing dredged material to construct the habitat transitional ramp would result in the placement of 10 acres (435,600 square feet) of fill. The ramp would improve drainage within the "Relic Berm Area" and provide transition and upland refugia habitat for marsh-dependent wildlife during extreme high tides and storm events. The ramp would have a three percent slope and vary in height from 0.001-feet to 2-feet above mean higher high water and the existing marsh plain. The lower- and

mid-portions of the ramp are designed to support marsh plant species while the upper portion would support vegetation typical of transition and upland habitat (e.g., coyote bush, creeping wildrye). The applicant states that the original design of the ramp called for filling the entire "Relic Berm Area" which would have involved 25 acres of fill within this tidal marsh. After discussions with BCDC staff, the ramp was reduced in size to a 10-acre ramp that would be located in a portion of the "Relic Berm Area" where tidal waters often pond and stagnate. A 10-acre ramp was determined to be the minimum necessary to provide transitional habitat at the project site at a scale that would provide value to marsh-dependent wildlife, while improving drainage and habitat conditions.

c. **Effects on Bay Resources.** As has been stated above, the project has been designed to address to address two problems that have been identified as affecting the habitat function and value of the marsh at the mouth of Sonoma Creek – poor tidal circulation and the lack of transitional habitat and upland refuge. The poor tidal circulation and drainage has also led to this marshland being a large source of mosquito production. The dredged material generated in creating and enhancing channels to improve tidal circulation would be used to fill tidal marsh areas that pond water and to create a mosaic of tidal and transition habitats typical of natural Bay marshes. While the project would result in net loss of approximately three acres of tidal marsh, it is expected the overall health and function of the 284-acre surrounding marsh would be improved with the project. The project would provide habitat for marsh-dependent species, in particular the special-status California clapper rail and the salt marsh harvest mouse. USFWS has developed a "Post-Construction Monitoring Plan" for the project to assess the project's potential impacts to natural resources, to allow adaptive management of the restoration efforts over time, and to increase the likelihood that the marsh restoration efforts are successful.

d. **Valid Title**. The USFWS has a 66-year renewable lease with the California State Lands Commission for the water and wetland areas of the site (all areas south of the levee).

   The levee that borders the project site on the north and west is owned by the Vallejo Sanitation and Flood Control District and would be used to access the site during construction. In addition, the upper portions of the habitat ramp would abut the District's levee. The project sponsor has obtained a "Right of Entry, Temporary Construction Staging, Stockpiling and Material Placement Agreement" with the District for the portions of the project that involve the levee. This agreement allows the sponsor to access the project site via the levee for construction and on-going monitoring activities, as well as to construct portions of the habitat ramp that abut the District's levee.

The Commission should determine whether the project is consistent with its law and policies regarding fill in the Bay.

2. **Public Access**

   a. **Maximum Feasible Public Access.** Section 66602 of the McAteer-Petris Act states that "…existing public access to the shoreline and waters of the…[Bay] is inadequate and that maximum feasible public access, consistent with a proposed project, should be provided." The Bay Plan Public Access policies state that "a proposed fill project should increase public access to the Bay to the maximum extent feasible…" and that "access to and along the waterfront should be provided by walkways, trails, or other appropriate means and connect to the nearest public thoroughfare where convenient parking or public transportation may be available."

   Currently the site is not open to the public. The levee and land immediately inland of the marshlands proposed to be enhanced are owned and operated by the Vallejo Sanitation District to treat biosolids. USFWS has contacted Vallejo Sanitation about the possibility of providing access on the levee, but the Vallejo Sanitation District has stated that public safety and existing regulations prevent opening the levee to the public. For this reason, USFWS contends that public access on site is not feasible and may interfere with one of the project goals of providing upland high tide refuge for marshland-dependent species. But this levee, referred to as the "Tubb's Island" levee, is designated as a "planned" segment of the San Francisco Bay Trail, is designated as a trail in Sonoma County's Countywide Parks and Recreation Plan, and would provide an important and safe link in the Bay Trail along the Highway 37 corridor.

   Because USFWS does not own the Tubb's Island levee, the Service explored possible off-site public access opportunities in the area. They identified a site located approximately 3.8-miles west of the project site that would consist of a 1,400 linear foot (0.26-mile), approximately 10-foot-wide trail that would extend along an existing levee separating the Sonoma Baylands restoration site (with existing, required access along the inland levee) and the Sears Point restoration site (permitted but not yet constructed, with proposed but not required public access). In addition to the trail, a small "bump-out" area with seating and interpretative signage would be provided. The trail would connect with existing access at the Sonoma Baylands site and access currently under construction with the Sears Point project.

   In addition to off-site public access, the proponent is committed to providing $49,000 in funds towards the "Students and Teachers Restoring a Watershed" (STRAW) program. This program would provide environmental education opportunities at the site to schools and volunteer groups and would focus on vegetating the habitat ramp with native plant species.

   In determining whether a project provides "maximum feasible public access to the Bay", the Commission often looks to its past actions on similar projects. While the Commission has authorized several large marsh restoration projects in recent years, primarily in salt ponds and all with significant public access areas and improvements, the Commission has only authorized a few projects where existing wetlands would be enhanced. At Lower Tubbs Island in the San Pablo Bay Wildlife Refuge

(Consistency Determination No. C1993.011.01), the Commission concurred in the USFWS's consistency determination that a smaller, but similar project where approximately 2,315 cubic yards of dredged materials from creating and enhancing tidal channels were placed on approximately 4.00 acres of wetlands to fill in depressions and reduce sources of mosquito production. As part of that project, USFWS made available for public use a new 2,000-foot-long by 15-foot-wide trail along the Tubbs Island Setback levee, immediately east of the enhancement site, provided a new interpretive panel at the end of the trail, and installed two seven-foot-wide by 25-foot-long prefabricated bridges to span two breaches in a levee supporting public access. In BCDC Permit No. M2010.032 to the Richardson Bay Audubon Center and Sanctuary and the Marin County Department of Parks and Open Space, approximately 7,650 cubic yards of sand, gravel, rock and oyster shell was placed over approximately a 2.17 acre area of the Bay to nourish an existing beach, promote oyster colonization, and create micro-groins to help retain sediment and foster beach development on Aramburu Island near Strawberry Point near the City of Mill Valley. Because the project improved habitat values on an island, access opportunities were limited. For this project, the Commission required two large, natural rocks with flat surfaces for sitting for boaters reaching the island, and two signs indicating that the island was sensitive habitat.

The Commission should determine whether the proposed project is consistent with the Bay Plan policies regarding public access and appearance, design and scenic views.

3. **Safety of Fills and Climate Change.** The Bay Plan policies on Safety of Fills state that "[a]dequate measures should be provided to prevent damage from sea level rise and storm activity that may occur on fill or near the shoreline over the expected life of a project…. New projects on fill or near the shoreline should…be built so the bottom floor level of structures will be above a 100-year flood elevation that takes future sea level rise into account for the expected life of the project." The Bay Plan policies on Climate Change state, "within areas that a risk assessment determines are vulnerable to future shoreline flooding that threatens public safety, all projects… should be designed to be resilient to mid-century sea level rise projection" and "[i]f it is likely the project will remain in place longer than mid-century, an adaptive management plan should be developed to address the long-term impacts that will arise…" The Climate Change policies go on to state that, "[u]ntil a regional sea level rise adaptation strategy can be completed, the Commission should evaluate each project proposed in vulnerable areas on a case-by-case basis to determine the project's public benefits, resilience to flooding, and capacity to adapt to climate change impacts." The policies also state that natural resource restoration projects "should be encouraged, if their regional benefits and their advancement of regional goals outweigh the risk from flooding."

   While this project will provide some flood protection, flood protection is not one of the project's objectives and the habitat transition ramp has not been designed to provide flood protection. Approximately 9,115 cubic yards of the material dredged to create and enhance channels would be placed on the Vallejo Sanitation District levee for the District's use to raise the levee as authorized in BCDC Permit No. M1994.025. The transi-

tion habitat ramp will also provide flood protection benefits by dampening waves at the site during extreme high tides and storm events. Concern was raised that placing so much fill against one side of the levee protecting the Vallejo Sanitation District's land might destabilize the levee. To address this concern, the project sponsor commissioned a geotechnical analysis that examined the potential effects of the habitat ramp on the stability of the perimeter levee. In a report dated October 16, 2014, Hultgren-Tillis evaluated the potential affects of placing 24,200 cubic yards of material along the western base of the levee and concluded that while construction of the ramp resulted in a computed 2.2-foot displacement of the levee during a seismic event, actual displacement would be in the range of three to six inches based on professional judgment and experience. The report concluded that such displacement would unlikely be detected by post-event inspection and that placement of the material associated with the ramp is not likely to undermine the stability of the levee.

As to how the site would be affected by sea level rise, currently, the entire project site is marshlands, most of which are regularly flooded with the tides. The entire site is inundated during high water conditions (9.0 feet NAVD88 (current 100-year flood elevation for the site)) and most of the site would continue to be inundated even after dredged materials would be placed within the marsh to create mounds and the habitat ramp. As stated earlier, all of the marsh mounds and approximately 2/3 of the 10-acre habitat transition ramp is expected to support marsh vegetation with today's tidal elevation. As the highest elevation of the transition habitat ramp would be two feet above today's marsh plain elevation, increasing portions of the ramp would be inundated with sea level rise. With a projected 11 inch rise by 2050, only the highest portion of the ramp would be above base flood elevation. With a projected 36 inch sea level rise by end of century, all of the habitat ramp would be below base flood elevation. There are no estimates for how the surrounding marsh will respond to sea level rise. Whether the marsh will persist will be dependent on a host of factors including sedimentation rates, erosion, plant response to climate change, etc.

The Commission should determine whether the fill proposed with the project is consistent with the Commission's safety of fills and sea level rise policies.

4. **Natural Resources**

   a. **Tidal Marshes and Tidal Flats.** The Bay Plan policies on tidal marshes and tidal flats state, "where and whenever possible, former tidal marshes and tidal flats that have been diked from the Bay should be restored to tidal action in order to replace lost historic wetlands or should be managed to provide important Bay habitat functions…." The policies also state, "[a]ny ecosystem restoration project should include clear and specific long-term and short-term biological and physical goals, and success criteria, and a monitoring program to assess the sustainability of the project. Design and evaluation of the project should include an analysis of: (a) how the system's adaptive capacity can be enhanced so that it is resilient to sea level rise and climate change; (b) the impact of the project on the Bay's sediment budget; (c) localized sediment erosion and accretion; (d) the role of tidal flows; (e) potential invasive species introduction, spread, and their control; (f) rates of colonization by

vegetation; (g) the expected use of the site by fish, other aquatic organisms and wildlife; (h) an appropriate buffer, where feasible, between shoreline development and habitats to protect wildlife and provide space for marsh migration as sea level rises; and (i) site characterization. If success criteria are not met, appropriate adaptive measures should be taken." The policies further state that, "[b]ased on scientific ecological analysis and consultation with the relevant federal and state resource agencies, a minor amount of fill may be authorized to enhance or restore fish, other aquatic organisms or wildlife habitat…."

The project would enhance approximately 293 acres of tidal marsh habitat and 9.42 acres of tidal channels, and create approximately 11.76 acres of transition and refugia habitat for marsh-dependent species, in particular the special-status California clapper rail and salt marsh harvest mouse.

Post-construction, the project proponent would conduct a 10-year monitoring program of physical processes, vegetation establishment, and invasive vegetation on the site to determine if restoration performance criteria have been met. If success criteria are not met, the proponent would analyze the cause of failure and propose remedial actions (e.g., adaptive management). The project sponsor would consult with the Commission to determine whether the proposed adaptive mitigation measures are consistent with the Commission's laws and policies and whether additional Commission authorization would be required. Although not a project goal, information about how the transition ramp functions in the face of sea level rise would be of key interest to other efforts to assure that San Francisco marshlands persist as sea level rises, and the effectiveness of horizontal levees as an adaptive strategy. One question is whether a 10-year monitoring program is sufficient to evaluate the effectiveness of the ramp in providing upland refugia and area for marsh transgression as sea level rises.

b. **Fish, Other Aquatic Organisms and Wildlife.** The Bay Plan policies on Fish, Other Aquatic Organisms and Wildlife state that, "[t]o assure the benefits of fish, other aquatic organisms and wildlife for future generations… the Bay's tidal marshes, tidal flats, and subtidal habitat should be conserved, restored, and increased." These policies also state that "[t]he Commission should consult with the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service or the National Marine Fisheries Service whenever a proposed project may adversely affect an endangered or threatened plant, fish, other aquatic organism or wildlife species…and give appropriate consideration of (their) recommendations in order to avoid possible adverse impacts of a proposed project on fish, other aquatic organisms and wildlife habitat."

On August 4, 2011, the project proponent requested intra-U.S. Fish and Wildlife Service formal consultation on implementation of the "San Pablo Bay National Wildlife Refuge Comprehensive Conservation Plan and Mosquito Management Plan," which includes the proposed project. On June 5, 2014, the USFWS issued a Biological Opinion (BO) on the effects of the project on special-status species. While the BO states that project would not adversely affect the endangered soft bird's

beak, the threatened Delta smelt, candidate longfin smelt and endangered California red-legged frog, project activities could potentially affect the endangered salt marsh harvest mouse and endangered California clapper rail. The Biological Opinion states that with the implementation of conservation measures, adverse effects to these species would be reduced or avoided. The Biological Opinion concluded that that proposed project would not "likely jeopardize the continued existence of these species…." The BO concluded that restoration of transition zone habitat for marsh-dependent species should be pursued for the purposes of benefitting endangered and threatened species.

On April 22, 2013, the USFWS requested concurrence from NOAA's National Marine Fisheries Service (NMFS) that implementation of the proposed project was not likely to adversely affect threatened or endangered fish species and essential fish habitat. The species potentially affected by the project include the Sacramento River winter-run Chinook salmon, the Central Valley spring run Chinook salmon, the Central California Coast steelhead, the Central Valley steelhead, and the North American Green Sturgeon southern "DPS".

NMFS determined that the project would adversely impact essential fish habitat through localized degradation of water quality during construction and the potential for invasive species propagation. However, impacts to water quality would be temporary and localized and the proponent would monitor invasive species conditions and remove invasive vegetation where appropriate. NMFS determined that since the project would result in long-term benefits to essential fish habitat due to enhanced tidal marsh habitat and resultant increases in prey species availability, and because adequate avoidance measures would be implemented during construction, that adverse effects to essential fish habitat would be avoided, reduced and/or minimized.

NMFS further determined that the proposed project would not likely adversely affect listed salmonids known to occur in the project area and critical habitat for the green sturgeon because implementation of the project would improve fish access to the marsh through channel enlargement. Because the project would result in an increase in the number and size of tidal channels within the Central Basin area, prey base and foraging opportunities for the green sturgeon and listed salmonids would be expected to increase. Lastly by improving tidal circulation within the marsh, long-term beneficial effects to critical habitat are anticipated.

c. **Water Quality.** The Bay Plan policies on Water Quality state that "Bay water pollution should be prevented to the greatest extent feasible. The Bay's tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible, restored and increased to protect and improve water quality." The policies also state that "[w]ater quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay as identified in the San Francisco Bay Regional Water Quality Control Board's (RWQCB) Basin Plan and should be protected from all harmful or potentially harmful pollutants." The policies, recommendations, decisions, advice, and authority of the State Water Resources

Control Board and the Regional Board should be the basis for carrying out the Commission's water quality responsibilities." Finally, the Bay Plan policies on Water Quality state that "new projects should be sited, designed, constructed, and maintained to prevent or, if prevention is infeasible, to minimize the discharge of pollutants into the Bay by: (a) controlling pollutant sources at the project site; (b) using construction materials that contain nonpolluting materials; and (c) applying appropriate, accepted, and effective best management practices; especially where water dispersion is poor and near shellfish beds and other significant biotic resources."

The project would provide important functions and values including improving on-site circulation and drainage patterns and providing enhanced wetland function which, in turn, would increase the natural water-filtering capability of the marsh. There is the potential for temporary impacts to water quality during construction activities. Several measures are proposed to reduce construction impacts on water quality including the installation of silt fences during construction to minimize erosion and sediment migration, locating construction staging areas in upland or adjacent agricultural area and providing environmental sensitivity training to contractors working on the project.

On June 26, 2014, the San Francisco Bay Regional Water Quality Control Board issued a conditional Water Quality Certification for the project that finds that the project does not violate state water quality standards.

The Commission should determine whether the project is consistent with its laws and policies regarding natural resources and water quality.

5. **Dredging.** The Bay Plan policies on Dredging state that "[d]redging and dredged material disposal should be conducted in an environmentally and economically sound manner." In particular, Bay Plan Dredging Policy No. 11(b) states: "[t]o ensure protection of Bay habitats, the Commission should not authorize dredged material disposal projects in the Bay and certain waterways for habitat creation, enhancement or restoration, except for projects using a minor amount of dredged material until: (1) Objective and scientific studies have been carried out to evaluate the advisability of disposal of dredged material in the Bay and certain waterways for habitat creation, enhancement and restoration…;(2) The Commission has adopted additional Baywide policies governing the disposal of dredged material in the Bay and certain waterways for the creation, enhancement and restoration of Bay habitat…and; (3) The Oakland Middle Harbor enhancement project…is completed successfully…."

   Bay Plan Dredging Policy No. 11(b) was adopted by the Commission in December 2000 following a multi-year, multi-agency and stakeholder process to develop a policy basis to evaluate traditional dredging projects (e.g., navigational dredging) and the beneficial reuse of dredged material. The first application of this policy by the Commission was in its approval of the Port of Oakland and the U.S. Army Corps of Engineers' "50-foot Deepening Project", which included the deepening of the Entrance, Inner and Outer Harbor channels at the Port of Oakland in December 2000. The "50-foot Deepening Project" involved the dredging of 15.9 million cubic yards of material from the Port of

Oakland's navigational channel and placement of the material at different locations, including three beneficial reuse sites that included the Montezuma Restoration Site, the Hamilton Wetlands Restoration Project and the Middle Harbor Enhancement Area (MHEA). At the MHEA, the Commission authorized the placement of 5.8 million cubic yards of sediment to be used within a 180-acre subtidal site to restore shallow water habitat, including the establishment of eelgrass meadows. At it's November 6, 2014 meeting, the Commission was briefed by staff on the status of the MHEA restoration project.

The Sonoma Creek Marsh Enhancement Project involves dredging 42,020 cubic yards of sediment from a tidal marsh. The dredging is being conducted solely to increase tidal circulation, drainage and channel density in the marsh which is expected to significantly improve the vitality and function of the surround 282-acre tidal marsh. This dredged sediment would be placed in the Commission's Bay jurisdiction to create marsh mounds to create high tide refugia (approximately 4,865 cubic yards), raise a depressed area behind a relic berm to improve site drainage (2,500 cubic yards), and to create a 10-acre habitat transition ramp to create transitional habitat, high tide refugia, and an area for marsh transgression (approximately 24,200 cubic yards). Approximately 9,115 cubic yards of the dredged sediment would be placed on top of the Vallejo Sanitation District levees to raise it.

Because the MHEA has not yet been completed, let alone determined to be successful, the Commission can only approve this project if it determines that the amount of dredged sediment placed in the Bay is "minor". The Commission has much discretion in determining what constitutes a "minor" amount of dredged material placed in the Bay because what constitutes a "minor" amount of dredged sediment is not defined in the Commission's law, regulations, or Bay Plan policies. This discretion is similar to the Commission's determinations regarding what constitutes "minor" amounts of fill for public access. Section 66605(a) of the McAteer-Petris Act allows the Commission to authorize minor amounts of Bay fill for public access and shoreline appearance if the fill is consistent with the other provisions of the Act.

In determining whether the dredged sediment placed with the proposed project is "minor", the Commission may also evaluate the project in light of other Commission-authorized dredging projects. Under the Commission's administrative regulations, Section 10602(f) states that, "…the disposal of less than 30,000 cubic yards of dredged material at any location…in a manner and at a time that is approved by the Executive Director…" shall be defined as a "minor repair or improvement" for which the Executive Director may issue project approval administratively. This project would authorize the placement of 31,565 cubic yards of dredged sediment within a tidal marsh (1,565 cubic yards more than can be administratively authorized to be placed anywhere in the Bay) to address problems in the functioning of the existing tidal marsh.

Further, the implied assumption of Bay Plan Dredging Policy 11(b) is that placing large quantities of dredged sediment in the Bay to create desired habitat has some risk, hence the restriction of demonstrated success before approving this approach elsewhere in the Bay. The proposed uses (creating habitat mounds, filling depressions, and to a lesser

extent, creating a habitat transition ramp which is a relatively new approach) have all been successfully employed in other tidal marsh enhancement efforts in San Francisco Bay. Thus, authorization of such fill placement is highly likely to result in the desired habitat benefits. Placing dredged material to create eelgrass habitat in San Francisco Bay is more experimental and has not yet been demonstrated to be successful in San Francisco Bay, though it theoretically should be able to be achieved.

The Commission should determine whether the dredged material placed with the project is "minor" under its laws and policies regarding dredging.

B. **Review Boards**

1. **Engineering Criteria Review Board.** The Commission's Engineering Criteria Review Board will not review the proposed project.
2. **Design Review Board.** The Commission's Design Review Board (DRB) has not reviewed the public access component of the project to date.

C. **Environmental Review.** On May 15, 2014, the Regional Water Quality Control Board (RWQCB), acting as lead agency under the California Environmental Quality Act, certified the Mitigate Negative Declaration for the project. A summary of the Mitigated Negative Declaration is attached as Exhibit K.

D. **Relevant Portions of the McAteer-Petris Act**

1. Section 66602
2. Section 66605
3. Section 66632

E. **Relevant Portions of the San Francisco Bay Plan**

1. *San Francisco Bay Plan* Policies on Fish, Other Aquatic Organisms, and Wildlife
2. *San Francisco Bay Plan* Policies on Water Quality
3. *San Francisco Bay Plan* Policies on Water Surface Area and Volume
4. *San Francisco Bay Plan* Policies on Tidal Marshes and Tidal Flats
5. *San Francisco Bay Plan* Policies on Subtidal Areas
6. *San Francisco Bay Plan* Policies on Safety of Fills
7. *San Francisco Bay Plan* Policies on Climate Change
8. *San Francisco Bay Plan* Policies on Public Access
9. *San Francisco Bay Plan* Policies on Dredging

Exhibits

A. **Project Vicinity**
B. **Project Area**
C. **Central Basin Enhancement Design**
D. **Relic Berm Area Enhancements**
E. **Marsh Upland Transition Ramp-Conceptual Cross-Section**
F. **High Marsh Lift-Conceptual Cross Section**
G. **Proposed Public Access**
H. **Site Isolation from Existing Public Access**
I. **CEQA Summary**