CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. R2-2017-0XXX

WATER QUALITY CERTIFICATION AND WASTE DISCHARGE REQUIREMENTS FOR:

U.S. ARMY CORPS OF ENGINEERS
SOUTH SAN FRANCISCO BAY SHORELINE PROJECT
SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board), finds that:

1. The U.S. Army Corps of Engineers (Corps, or Discharger) applied to the Regional Water Board for approval to construct the South San Francisco Bay Shoreline Project (Project). The Corps intends to build the Project in three phases over approximately 14 years.

2. **Application.** On June 16, 2017, the Corps filed an application for CWA section 401 Water Quality Certification with the Regional Water Board for authorization to implement the Project (33 U.S.C. section 1341). The Regional Water Board used this information to determine compliance with California Water Code (Water Code) section 13360, which requires a Report of Waste Discharge for issuance of Waste Discharge Requirements (WDRs).

3. **Order Authorization.** This Order authorizes, subject to the requirements herein, Project Reaches 1 through 3, and mitigation and monitoring activities, including ecosystem restoration and adaptive management actions. Additionally, it conditionally authorizes the remaining parts of the Project (Reaches 4 and 5), by setting forth a process by which the Project's remaining construction events and phases may be authorized, subject to applicable public, Water Board, and Executive Officer review. Authorization of Reaches 4 and 5 is conditioned on additional submittals, including acceptable design plans and supporting documentation, and associated review, as described herein. The Order identifies potential Project impacts to water quality and beneficial uses and requires necessary measures, including the successful implementation of compensatory mitigation, to address them.

4. **Local-Federal Partnership.** The Corps is partnering with the California Coastal Conservancy (Coastal Conservancy) and the Santa Clara Valley Water District (District) to increase flood protection and provide shoreline resiliency against projected sea level rise (SLR) to protect the community of Alviso and valuable shoreline infrastructure, and restore tidal action to about 2,900 acres of historically diked baylands. The WRDA of 1986, Public Law 99-662, as amended (United States Code, title 33, section 2213) stipulates that the Non-Federal Sponsors (the Coastal Conservancy and District) will contribute 35 to 50 percent of the total Project cost. The Corps and Non-Federal Sponsors are each funding Project costs and are coordinating the division and/or various shared roles and responsibilities, such as design, construction, and post-construction operations, which arrangements will be formalized in accordance with the Project Partnership Agreement (PPA) that will be signed by the Corps, Coastal Conservancy, and

District when Congress appropriates funds in the Construction General account. The cost-sharing schedule specifically requires the Corps to conduct (and/or oversee) construction contracting and activities and the Non-Federal Sponsors to provide all lands, easements, rights-of-way, relocations, and disposal areas (LERRD). A design agreement between the Corps, Coastal Conservancy, and District has been used to move the Project forward until the PPA is signed. The design agreement was signed on July 11, 2016, and states the Non-Federal Sponsors shall contribute 35 percent of the total design costs, in accordance with the WRDA of 1986, Public Law 99-662, as amended (United States Code, title 33, section 2215, subsection c).The WRDA also requires the Corps to prepare an operations and maintenance manual for the Project.

5. **Discharger.** The Water Board is issuing this Order to the Corps, the Coastal Conservancy, and the District, collectively referred to as the Discharger, because Project activities will cause or contribute to a discharge of waste that will affect the quality of waters of the U.S.[1] The nature of WDRA projects is that the partnership between the Corps and the Non-Federal Sponsors is inextricable, and the Project could not occur without each sponsor. Therefore, the Water Board is naming the Corps and the Non-Federal Sponsors, who are the Project co-sponsors, as dischargers. As appropriate, this Order notes which partner has agreed to be responsible for certain requirements based on WRDA requirements, as well as the Water Board's understanding of the agreements the Corps, Conservancy, and District have made with each other.

   The Discharger will implement the Project as described in the application materials and herein. As described in the agreement among the Corps and Non-Federal Sponsors, once the flood risk management (FRM) levee is constructed and fully functional, the Corps will transfer the levee's operation, maintenance, and management responsibility to the District. The Corps and the Non-Federal Sponsors will share financial responsibility for the ecosystem restoration monitoring and adaptive management. However, the Corps' ecosystem restoration cost sharing obligation is restricted to ten years following each pond-breaching event. Once the Discharger's cost-sharing obligation ends, the Non-Federal Sponsors will assume the total cost for each pond's long-term operation, maintenance, and management. Currently, the Non-Federal Sponsors are negotiating how their respective roles and responsibilities will be divided during the ecosystem restoration's long-term operation, maintenance, and management.

6. **Project Purpose.** The Project's overall purpose is to safeguard homes, schools, and businesses along Santa Clara County's shoreline, including Alviso and the San Jose/Santa Clara Regional Wastewater Treatment Plant, from the risk of tidal flooding by constructing a levee and restoring and enhancing tidal marsh and related habitat that was lost due to former salt production activities. The Project's overall purpose will be achieved through implementation of a flood risk management (FRM) levee and ecosystem restoration. The Project's objectives are to:

[1] Waters of the United States are subsumed within waters of the State. All of the surface waters discussed in the Order are both waters of the State and United States. For ease of reference, these WDRs refer to both as waters of the U.S. Groundwater, a water of the State only, is addressed separately, where applicable.

- Reduce the risk to public health, human safety, and the environment due to tidal flooding along the South Bay shoreline in Santa Clara County, by providing protection from the 1 percent annual chance of exceedance flood (i.e., the 100-year event), taking into account anticipated sea level rise through 2067.

- Reduce potential economic damages due to tidal flooding in areas near the South Bay shoreline in Santa Clara County.

- Increase contiguous tidal marsh to restore ecological function and habitat quantity, quality, and connectivity in the Project Area.

- Provide opportunities for public access, environmental education, and recreation in the Project site.

7. **Site Description and Background.** The Project site is located between Alviso Slough/Guadalupe River and Coyote Creek and includes the community of Alviso and the San Jose-Santa Clara Regional Wastewater Facility (RWF). The Alviso pond complex is within the Project site, and the RWF is located to the southeast (Att. A, Figures 1 to 3). The Alviso pond complex consists of 25 ponds over approximately 9,000 acres of former salt production ponds along 15 miles of shoreline between Palo Alto and Fremont. The United States Fish and Wildlife Service (USFWS) owns and manages about 8,000 acres of former salt ponds within the Alviso pond complex. The approximately 820-acre Pond A18, just outside the Alviso pond complex, is owned by the City of San Jose and located within the Project site.

   The community of Alviso has over 2,000 residents, 500 structures, and 3,000 commuters who work and travel through the area each day. The surrounding low-lying terrain is mostly urban and contains portions of Silicon Valley, transportation corridors, and other critical infrastructure.

   Low-lying terrain within the area is the result of widespread overdraft of groundwater for agricultural and urban uses during the early and middle decades of the 20th century. This overdraft led to severe ground subsidence under most of the Santa Clara Valley and portions of the South Bay, including many of the Project site's former salt ponds. Salt pond dikes were raised by their owners, and outboard tidal marshes accumulated sediment quickly enough to maintain their elevation. However, without tidal flows, the floors of the salt ponds and adjacent alluvial plains had no way to compensate for the previous loss in elevation. In addition, the non-engineered berms protecting these areas from tidal flooding are dikes that were created as early as the 1920s, and generally maintained to protect the ponds from tidal flooding when they were used for salt production. These dikes were not engineered or intended to reduce flood risk for urban areas. While groundwater overdraft has ceased and the water table has recovered considerably, the previous loss of elevation is permanent.

Due to this subsidence, many areas landward of the former salt ponds have become vulnerable to tidal flooding. Alviso is at or below an elevation of 5 feet NAVD88, which is lower than the mean higher high tides in the area. During a 1983 flood event, floodwaters from Coyote Creek reached a depth of 6 feet in Alviso, and more than 1,700 residents were flooded.

The Project site's flood risk is exacerbated by the substantial sea level rise that is expected during the Project's fifty-year planning horizon (2017-2067). The Discharger has estimated that regional sea level rise will be between 0.51 feet and 2.59 feet. This increase in sea level will put the community of Alviso and surrounding area at a greater risk of flooding than currently present. The Project will provide flood protection to Alviso by constructing a flood risk management (FRM) levee and restoring tidal action to Ponds A9 to A15, within the Alviso pond complex, and Pond A18. Project construction will occur in three phases that will be completed in about 2032, but monitoring and adaptive management will continue until about 2047.

8. **Project Construction Phasing.**

The Project will be constructed in three phases through six total construction events, as described below. All phases are authorized or conditionally authorized by this Order. Phase I is expected to result in Project impacts and the ecosystem restoration work in Phases I, II, and III is intended to provide mitigation for those impacts. However, monitoring data for the Phase I ecosystem restoration Project component may indicate breaching the ponds in Phases II and III would not facilitate tidal marsh restoration or result in other environmental benefits. In that event, Project Phases II and III may not be constructed. If Phase I is successfully implemented and the Discharger does not move forward with Phases II and III, the Discharger will submit supplemental information on Project impacts and proposed alternative mitigation, as appropriate and as described in the Provisions.

Phase I: Phase I activities include the FRM levee construction, ecotone creation, and restoration of Ponds A12 and A18 to tidal action. The levee length has been divided into five reaches. The FRM levee will be constructed first along those five reaches to provide immediate flood protection by increasing the levee height. While the FRM levee is being constructed, fill for Project construction may be stockpiled in the ecotone footprint, as described elsewhere herein.

Transitional wetland habitat (ecotone) will be created along the Bayward side of the FRM levee within three of the ponds. The first two ecotones will be created in Ponds A12 and A13 once the FRM levee construction has been completed along Reaches 1 through 3. The third and final ecotone will be created in Pond A18 once the FRM levee construction has been completed along reaches 4 and 5. Once the FRM levee has been completed and tied in to existing levees, tidal action will be restored to Ponds A12 and A18 by breaching their respective outboard dikes.

Additional Phase I activities that are authorized by this Order, but are not expected to result in the placement of fill into waters of the U.S. beyond that otherwise described in the Order,

include the following:

- Construction of a pedestrian bridge over Artesian Slough to link multi-use trails;
- Completion of public access improvements that will create multi-use trails, mostly on the tops of the FRM levees, to connect to the Bay Trail network; and
- Appropriate infrastructure construction where the Project crosses the Union Pacific railroad tracks and Artesian Slough to ensure the Project can provide effective flood protection while still allowing the railroad to function effectively. This Order does not authorize a separate project to modify the railroad line to address the effects of anticipated sea level rise.

After Phase I activities have been completed, additional ponds will be breached in specific locations to restore tidal action to the ponds, allow sediment carried by the tides into the breached ponds, and allow for the reactivation of remnant channels in the pond bottom. Once the salt ponds have been restored to tidal action, the anticipated result is large-scale tidal marsh restoration from sediment accretion, marsh vegetation colonization, and ongoing adaptive management actions.

Phase II: It will restore Ponds A9, A10, and A11 to tidal action in generally the same manner as for ponds breached in Phase I. Ongoing monitoring data from the previous Project phase will be used to inform restoration strategies for Ponds A9, A10, and A11.

Phase III: This final Project phase will restore Ponds A13, A14, and A15 to tidal action in generally the same manner as for ponds in Phase I. Similar to Phase II, ongoing monitoring data from previous Project phases will be used to inform restoration strategies for Ponds A13, A14, and A15.

Project Phasing: Phasing the Project is necessary because the levee and ecotone components must be completed prior to restoring the salt ponds to tidal action to ensure that landward flood protection is maintained. The phasing also allows the anticipated ecosystem restoration to have a higher likelihood of success by allowing the Discharger to implement lessons learned from monitoring salt ponds that will be restored in earlier phases. Additionally, the phasing will allow material that will be used for the FRM levee and ecotone construction to be acquired from various sources. The Project will be constructed over approximately 14 years (see Table 1).

Table 1: The Project phases and anticipated construction timeline (Att. A, Figure 4).

Phase	FRM Levee Construction (Reach No.)	Tidal Marsh Restoration (Ponds)	Ecotone Creation (Ponds)	Anticipated Construction (Year)
I	1	--	--	2018
	2 and 3	--	A12 and A13	2019
	4 and 5	--	A18	2020-2021
	--	A12 and A18	--	2022
II	--	A9, A10, and A11	--	2027
III	--	A13, A14, and A15	--	2032

9. **Related Projects.** The Project is closely related to the ongoing implementation of the South Bay Salt Pond Restoration Project (SBSPRP) (Order No. R2-2004-0018, as reissued and amended [R2-2008-0078; R2-2012-0014]). The SBSPRP is located in South San Francisco Bay and consists of three former salt pond complexes and adjacent habitats: the Alviso Ponds, Ravenswood Ponds, and Eden Landing Ponds. The SBSPRP is similarly phased to allow prior construction and restoration activities to inform future phases, and the same conceptual ecological model used in the SBSPRP will be implemented in the Project's adaptive management strategy. The planning process for the Project is being coordinated with the SBSPRP actions, as both efforts have similar flood protection, ecosystem restoration, and recreation objectives.

   The Coastal Conservancy, District, and USFWS are currently collaborating to implement the SBSPRP, which encompasses 15,100 acres in the South Bay. As part of the SBSPRP, a range of potential implementation and habitat outcomes were identified, with the endpoint to be determined through phased implementation guided by adaptive management. A "staircase" analogy was used in the SBSPRP to describe the proposed project, with each step on the staircase representing one phase of tidal restoration implementation. Adaptive implementation determines how far "up the staircase" the project proceeds.

The following Findings present a more-detailed discussion of aspects of the Project and are organized into four sections: (I) South San Francisco Bay Shoreline Project (Project); (II) Reaches 1 to 3; (III) Maintenance and Management; and (IV) Other Findings.

I. South San Francisco Bay Shoreline Project (Project)

10. **Phase I (2018-2022)**: Phase I of the Project consists of the construction of approximately 3.8 miles (19,775 ft.) of new levee from the Alviso Marina northeastward to the northeastern corner of the RWF property; ecotone creation; and Pond preparation, breaching, and restoration. The entire FRM levee is divided into five reaches (Reaches 1 to 5) that are grouped into two segments, as shown in Table 2. Phase I activities are further divided into four construction events, as summarized in Table 3.

Table 2: Summary of FRM levee construction by Reach (Att. A, Figure 4).

Phase	Reach No.	Segment	Adjacent Ponds	Anticipated Start of Construction (Year)
I	1	Alviso	A12 and A13	2018
	2		A16	2019
	3		A16	2019
	4	RWF	A18	2020-2021
	5		A18	2020-2021

Table 3: Summary of Phase I's construction events and activities (Att. A, Figure 4).

Phase	Construction Event	Activity	Anticipated Construction (Year)
I	First	Construct FRM levee Alviso segment (Reach 1); stockpile fill material in Ponds A12, A13, and A18	2018
	Second	Finish FRM levee Alviso segment (Reaches 2 and 3); create two ecotones in Ponds A12 and A13; stockpile material in Pond A18 as needed	2019
	Third	Complete FRM levee by starting and finishing RWF segment (Reaches 4 and 5); create third and final ecotone in Pond A18	2020-2021
	Fourth	Breach Ponds A12 and A18	2022

The first two construction events in Phase I include construction of the FRM levee's Alviso segment (Reaches 1 to 3), creation of new upland/marsh transitional habitat (ecotone) in Ponds A12 and A13, and stockpiling construction material. The FRM levee's Alviso segment is approximately 1.7 miles long and follows the eastern border of Pond A12 and the southern borders of Ponds A13 and A16. Ecotones will be created along approximately 3,600 linear feet of Reach 1 on the east side of Pond A12 and along approximately 600 linear feet of Reach 1 on the southern side of Pond A13 during Phase I's second construction event. Approximately 28.79 acres of ecotone will be created in Ponds A12 and A13. Following construction of the ecotone, it will be seeded with native grasses, forbs, and low non-woody shrubs.

The third construction event in Phase I includes completion of the entire FRM levee, from construction of the RWF segment (Reaches 4 and 5), and creation of the third ecotone in Pond A18. The FRM levee's proposed conceptual alignment for the remaining 2.1-mile RWF segment follows the southern border of Pond A18. Connecting the Alviso and RWF segments requires crossing Artesian Slough. The Discharger's conceptual levee design is currently proposed to run west to east in a stair step pattern along the southern border of Pond A18, from the southwest corner of the pond to its northeast corner. However, the Discharger has not finalized the FRM levee's RWF segment because a cheaper landward alignment is under evaluation (see Finding 13) (Att. C). The landward alignment under evaluation would require less fill, thereby reducing overall Project cost, and maximize the Project's ecosystem restoration. The ecotone created in Pond A18 using the proposed conceptual alignment would be approximately 62.73 acres.

The fourth and final construction event in Phase I will consist of breaching the outboard dikes for Ponds A12 and A18. Monitoring and adaptive management of the Ponds A12 and A18 after breaching is necessary to inform future pond breaches.

FRM Levee: The earthen FRM levee will increase the existing levee height by approximately 10 feet to a design elevation of 15.2 feet NAVD88, after settlement. To accommodate the increase in levee height, the FRM levee's width will be 16 feet at its crest, about twice as wide as the existing levee's width. The FRM levee's design elevation of 15.2 feet corresponds to the levee height that will provide flood protection from a one percent annual chance of exceedance (ACE) flood that includes SLR estimates used by the Discharger (see Finding 17). The flood protection against a one percent ACE flood in 2067 meets Federal Emergency Management Agency (FEMA) criteria. The proposed levee height was requested by the District and Coastal Conservancy to allow for continued FEMA accreditation at the end of 2067 and meet local FRM requirements in Santa Clara County. The one percent annual chance of exceedance level of flood risk protection is consistent with FEMA requirements for eligibility in the National Flood Insurance Program.

The existing dike material along Ponds A12, A13, and A18 has relatively high plasticity and contains organics that make it unsuitable to remain in place or serve as fill for the new FRM levee, but the dike material may be suitable for future ecotone construction. Fill for the FRM levee construction will be imported from local sources and delivered by truck. The Discharger plans to use some fill material from nearby creek dredging projects to reduce Project costs. All imported dredged material must meet established screening criteria for reuse based upon the Water Board's beneficial reuse guidelines for dredged material. Other elements, such as geotextile fabric, stone foundation columns, and foundation over-excavation may be included in the final levee design.

Vegetation is included in the levee design as erosion protection on the Bayward and landward side slopes. The vegetation is anticipated to be continuous and serve as erosion protection. Marsh vegetation will be seeded or planted at the toe of the levee following construction. Peripheral halophytes such as 12- to 18-inch tall pickleweed (*Salicornia pacifica*) will be planted at the toe of the levee. Upland grasses will be seeded at higher elevations on the side slopes between the levee crest and the pickleweed. Combinations of buried stone protection and buried gravel may be necessary to provide erosion protection in areas where the vegetation cannot be supported or to stunt the growth of native vegetation to reduce the frequency of vegetation maintenance activities, such as mowing, near the levee crest.

Certain locations may require special structures or treatment, as follows:

- The new FRM levee will diverge from the existing levee alignment by cutting across Pond A12 in the southwestern area. The divergence from the existing alignment will

make construction easier by avoiding two 90-degree bends in the levee. This divergence will shorten the levee length, thereby requiring less fill material.

- Where the levee crosses an existing water feature, such as a slough, structures will be installed to allow flow during normal conditions and during flood conditions. This Order requires that the design for the Artesian Slough crossing not adversely alter the adjacent RWF's discharge quality and hydraulics.

- Where the levee crosses below-ground infrastructure (e.g., utilities), load-bearing structures may be needed to support the weight of levee materials over the infrastructure.

- Floodgates will be installed where the Reach 1 FRM levee crosses the active Union Pacific Railroad (UPRR) tracks.

Ecotone Creation: Ecotone creation will occur along the Bayward sides of Reach 1 (Ponds A12 and A13), Reach 4 (Pond A18), and Reach 5 (Pond A18). The ecotones will be constructed with a 30:1 horizontal to vertical slope. The ecotones' gradual slope will add up to 345 feet to the width of the Bay side of the levee footprints at these locations. The first two ecotones will be created along 3,600 linear feet of the levee on the east side of Pond A12, and approximately 600 feet on the south side of A13. In Ponds A12 and A13, approximately 28.79 acres of ecotone will be created in total. The third ecotone will be created Bayward of the FRM levee through Reaches 4 and 5. Approximately 62.73 acres of ecotone will be constructed along approximately 14,000 linear feet of levee along Pond A18. In total, approximately 91.52 acres of ecotone will be created.

The new ecotones will provide substantial benefits for wildlife in the Project site and nearby areas because this type of habitat is not well represented in the South Bay. Further, the ecotone slopes will allow the transgression of estuarine marsh habitats over uplands as sea level rises, maintaining over time the Bay-adjacent estuarine-terrestrial transition zone (Att. A, Figure 5). Vegetation in the upland transitional areas will be limited to herbaceous, low non-woody and semi-woody plants, and possibly shallow-rooted shrubs; it will be otherwise unmanaged, except to control invasive plants from establishing.

Ponds A12 and A18 Tidal Restoration: Ponds A12 and A18 are proposed for the first phase of restoration because they have experienced the greatest degree of subsidence, and their bottom elevation is too low to support intertidal marsh vegetation. Restoring tidal action to Ponds A12 and A18 maximizes the potential for the sites to accrete sediment transported from the Bay on flood tides. After Pond A12 is breached, the anticipated sediment deposition is expected to raise its bottom elevation sufficiently to support colonization by intertidal marsh vegetation. Pond A18's bottom elevation is so low that, after it is restored to tidal action, several feet of sediment deposition from sediment transported on flood tides will be needed before the pond bottom reaches a sufficient elevation to support colonization by marsh vegetation. The sedimentation

process is expected to proceed at rates determined in part by suspended solids concentrations in the South Bay as well as factors causing re-suspension of sediment, such as wave action and tidal currents, in the South Bay and breached pond (ESA PWA 2012; HTH 2012). Internal pond dike breaches will be conducted to reconnect historical channels and restore hydrologic connections to the innermost ponds in the Project footprint. Breach sizes will be consistent with *Design Guidelines for Tidal Wetland Restoration in San Francisco Bay* (PWA 2004).

Pilot channels will be constructed on the outboard side of the pond dikes, where the breaches will occur, to facilitate and concentrate flow into the pond when the dikes are breached. Each pilot channel will be located along the locations of historical tidal channels (Att. A, Diagrams 2 and 3).

Ditch blocks will be constructed in areas within the inboard edge of the pond to direct flow away from undesirable locations and towards the desired locations. The blocks will be constructed within borrow ditches along the inboard perimeter of the ponds. Once the dikes are breached, the ditch blocks will be located in strategic areas around the inboard edge of the pond to inhibit incoming flow through the existing borrow ditches and redirect flow towards the remnant historical channels to promote scour and restore their form and function. The ditch blocks are also expected to provide some initial pickleweed habitat in locations where the elevations are suitable for such growth. Without the ditch blocks, the incoming flow from the breached dikes would take a preferential path through the borrow ditches around the inboard perimeter and reduce the likelihood that historical tidal channels would be restored to form complex dendritic channels. Complex dendritic channels in the ponds are a critical hydrodynamic component and serve ecological functions such as foraging by special-status species.

To prepare Pond A12 for breaching, berms will be constructed between Pond A12 and Ponds A11 and A13. These berms will be temporarily (i.e., until tidal action is restored to Ponds A11 and A13) raised to provide flood protection for ponds A11 and A13 when Pond A12 is breached. Starter channels will then be excavated within Pond A12 to facilitate restoration of the historical tidal channels within the pond. This will improve water and sediment circulation in the pond and help accelerate marsh restoration. If determined to be suitable, surplus material excavated from pond preparation would be used to contribute to other in-pond construction activities that require material, such as raising of internal dikes. Pond A18 will be prepared for breaching by using a procedure similar to Pond A12's breaching preparation.

Following restoration of tidal flows to Ponds A12 and A18, monitoring will be conducted to measure the physical and ecological processes and conditions, such as tidal exchange, sediment accretion, and vegetation establishment. If necessary, corrective measures will be implemented, consistent with the procedure described in the Monitoring and Adaptive Management Plan (MAMP). A period of approximately ten years has been planned for monitoring and adaptive

management of the pond areas, but monitoring and adaptive management will continue until at least 2048.

11. **Phase II (2027)**: Phase II is the fifth construction event and consists of restoring Ponds A9, A10, and A11 to tidal action. Ponds A9, A10, and A11 will be prepared for breaching in a similar fashion as Ponds A12 and A18 during Phase I, with the application of lessons learned from monitoring Ponds A12 and A18 after they were restored to tidal action. The decision to breach these ponds will be based on the MAMP and the most up-to-date version of the Ecotone and Pond Monitoring Plan (EPMP) (see Provision 34) prior to commencement of Phase II, and the decision framework in the SBSPR MAMP. These decisions involve monitoring populations of pond-associated birds and monitoring of sediment accretion in the South Bay, among other factors.

    Preparing the Phase II ponds for breaching will be conducted in a similar manner as Phase I, but lessons learned from Phase I will be incorporated into the pond preparation sequence to improve the restoration of tidal action. Pond A11 will be connected to Ponds A10 and A12 with inboard berm breaches, but it will not be breached directly to Alviso Slough. Two breaches to Alviso Slough are planned in Pond A10, and one breach each to Alviso Slough and Coyote slough are planned for Pond A9. Internal berms between Ponds A9 and A11 and Ponds A13 and A14 will be temporarily raised (i.e., until breaching of ponds A13 and A14 in 2032) to provide flood protection for Ponds A13 and A14.

12. **Phase III (2032)**: Project Phase III is the sixth construction event and consists of restoring Ponds A13, A14, and A15 to tidal action. Pond preparation for Ponds A13, A14, and A15 will be implemented based on the lessons learned from the mitigation and monitoring conducted for previously restored ponds. Similar to the Phase II breaching, the data collected, as described MAMP and supporting documentation, from post-construction monitoring of previous phases will be used to decide if these ponds should be breached and restored to tidal marsh, subject to public and Water Board review as described herein.

    Prior to breaching the ponds restoring them to tidal action, a single pilot channel will be excavated and ditch blocks will be constructed. Only one outboard breach is planned for tidal restoration in these three ponds; this breach will connect Pond A15 to Coyote Creek along a major historical channel. Inboard berm breaches at the locations of historical sloughs will provide connections to Ponds A13 and A14 from the surrounding ponds (A9, A11, A15, and A12).

Future Project Considerations and Permitting:

13. **Future Project Design Decisions.** The Discharger has identified a conceptual FRM levee alignment for the levee beyond Reaches 1 to 3, from Artesian Slough to its terminus at Coyote Creek. All future Project components require additional investigation by the Discharger,

including supplemental analysis for each reach, collection of monitoring and maintenance data, and collection of monitoring and maintenance data to the Project area. This Order sets forth a process by which an acceptable levee alignment and other design details can be determined. The following are significant alignment and design issues to be considered:

Artesian Slough Crossing: The FRM levee will need to cross Artesian Slough in order to connect the Alviso (Reach 3) and RWF (Reach 4) segments. Artesian Slough is currently used by the RWF to discharge treated wastewater and meet their effluent requirements under their National Pollution Elimination Discharge System (NPDES) permit. The mixing and dilution for the RWF's discharges cannot be affected in a way that would cause non-compliance with the RWF's current NPDES permit, and the design must address the RWF's need to discharge treated wastewater to the Bay.

The Discharger's proposed Artesian Slough crossing design is intended to protect the RWF from storm waters and tidal surges that flood the Slough and back up into the RWF during extreme storm events. The proposed location of the tide gate would be at least 300 feet Bayward of the existing RWF outfall for treated water at the Slough. The gates would only be closed during extreme storm events. When the gates are closed, the RWF would need to pump treated water over the proposed tide gate, or provide internal excess water storage during a storm event. With or without the Project, the RWF will develop a plan to pump or store waters during such events because of increases in Bay water levels that correspond with future sea level rise scenarios. To best meet the general operation requirements for the RWF and allow for discharge during storm events, the tide gate will be designed in coordination with RWF engineers. This Order requires the Discharger to submit additional information regarding the crossing's proposed design and to obtain the Water Board Executive Officer's approval prior to constructing that component.

Reach 4 to 5 FRM Levee Alignment (RWF Segment): The Discharger's proposed levee alignment east of Artesian Slough along the RWF segment would result in a net loss of waters of the U.S. That proposed alignment would follow, in part, the Pond A18 levee that runs west to east in a stair-step pattern.

Landward Levee Alignment East of Artesian Slough: Water Board staff provided feedback to the Discharger, prior to its application submittal, about opportunities to reduce Project impacts to waters of the U.S. The Water Board described a potential levee alignment east of Artesian Slough (Reaches 4 and 5) that is landward of both (a) existing mitigation wetlands north of the RWF and (b) approximately 100 acres of the RWF's legacy biosolid ponds. The Water Board provided the Discharger with technical evidence (Att. C) that this or a similar landward levee alignment east of Artesian Slough likely would reduce the volume of earthwork, be cheaper and easier to construct, reduce or potentially eliminate the immediate net loss of waters of the U.S., increase the acreage, function, and value of tidal wetlands in the area, and provide an opportunity for the City of San Jose to address the legacy biosolid ponds at its RWF. The Discharger described this proposed alignment in their Application as the Pond A18 Alternative.

Material Stockpiling: Two of the largest constraints to the Project success are the need to secure a sufficient amount of suitable fill at an acceptable cost and the need for sufficient area to stockpile the millions of cubic yards of soil required to construct all reaches of the FRM levee and the A12, A13, and A18 ecotones. Phase I, Reach 1 addresses the need for suitable stockpiling area by allowing stockpiling in the future ecotone footprints in Ponds A12, A13, and the easternmost portion of A18, adjacent to the existing berm along the active biosolids ponds, during the initial construction activities (Att. A, Figures 7a and 7b). Material stockpiling in Ponds A12, A13, and A18 may be restricted to the future ecotone footprint within the ponds. Prior to stockpiling fill material, Ponds A12, A13, and A18 may be dewatered to facilitate dry stockpiling conditions. Water in Ponds A12 and A13 may be pumped out of the ponds to lower the water levels temporarily. Pond A18 may be passively dewatered by gravity flow through existing water control structures on artesian slough as much as possible, but the pond may also be pumped to reduce water levels to an appropriate height in areas where passive dewatering will not be effective (e.g., borrow ditches, former marsh channels). The stockpiling is limited to a maximum height of 17 feet, which is approximately the height of the City's sludge pond berm.

14. **Project Alternatives Analysis**: While the overall Project design for the FRM levee along Reaches 1 to 5 has not been finalized, the Discharger has demonstrated that the currently proposed alignment along Reaches 1 to 3 is the least environmentally damaging practicable alternative along those reaches, and the Reach 1 to 3 alignment is not expected to change. The Discharger evaluated overall Project alternatives, including specific reach alignments for the FRM levee, in the *Clean Water Act Section 404(b)(1) Determination, South San Francisco Bay Shoreline Phase I Study, Santa Clara County, California* (HDR, July 1, 2015) (404(b)(1) Determination) as an appendix to the FEIR. The Discharger submitted a brief discussion of the alternatives considered in the FEIR and the Water Board-proposed landward levee alignment in Reaches 4 and 5 in the Application with an emphasis on the FRM levee alignment across Artesian Slough and along the RWF segment. This Order acknowledges the need to fully evaluate and reevaluate alternative levee alignments east of Reach 3 (i.e., for the crossing of Artesian Slough and Reaches 4-5) as designs are finalized, in order to optimize the tidal marsh restoration opportunities while further reducing impacts to waters of the U.S.

15. **Authorization Process for Future Project Phases.** This Order requires supplemental applications that contain additional or revised information, including supplemental analysis and design plans for future Project work with supporting documentation that demonstrates the Project maximizes ecosystem restoration and minimizes the net fill of waters of the U.S., before construction of future Project components may commence. The future submittals will be subject to public review and approval by the Regional Water Board or the Executive Officer (see below). In addition, depending on overall Project impacts and tidal restoration success, this Order may be modified to require compensatory mitigation beyond that now required herein.

This Order requires that the supplemental analysis for Reaches 4 and 5 address the impacts of alternative levee alignments on (a) anticipated rates and extent of post-breach establishment of vegetated tidal marsh; (b) long-term water management operations, water quality, and habitat functions/values in the City and landfill mitigation marshes given anticipated sea level rise (Att. C, Figures 1 and 3); and (c) anticipated attenuation of wave energy by vegetated tidal marsh seaward of the ecotone.

Supplemental analysis will also include additional information and designs for the Artesian Slough crossing, ecotones in Ponds A12, A13, and A18, and pond breaching. The current Pond breaching approach is generally suitable. If initial post-construction monitoring data indicate a high likelihood of success, the Pond breaches may be authorized by the Water Board's Executive Officer, subject to applicable public review (see below).

Executive Officer Approval: This Order requires that supplemental applications provide supporting documentation to refine the Project as presented herein, including a range of alternative landward alignments along Reaches 4 and 5 that maximize ecosystem restoration opportunities and reduce overall Project cost. Those supplemental applications must be submitted to the Water Board's Executive Officer for review and approval. Supporting documentation includes 30, 60, 90, and 100 percent design plans and the supplemental analysis described above (see Table 4).

Table 4: Summary of the subsequent Project work and information needed for approval.

Phase	Construction Event	Construction Activity	Supplemental Application Requirements
I	Second	FRM Levee, Reaches 2 and 3	Engineering Designs
	Third	FRM Levee, Reaches 4 and 5	Engineering Designs and Supplemental Analysis
	Fourth	Tidal Action Restoration to Ponds A12 and A18	Engineering Designs and Supplemental Analysis
II	Fifth	Tidal Action Restoration to Ponds A9, A10, and A11	Engineering Designs and Supplemental Analysis
III	Sixth	Tidal Action Restoration to Ponds A13, A14, and A15	Engineering Designs and Supplemental Analysis

Any Project changes that deviate from the Project described herein, not including the landward alignment along Reaches 4 and 5, or a similar alignment that would reduce the Project's impacts, are considered significant and will be presented before the Water Board for review and approval prior to implementation. Significant changes include, but are not limited to, any increase in net fill of waters of the U.S., failure to complete the Project as described herein, and any Artesian Slough crossing design that may alter the RWF's ability to meet mixing requirements described in its NPDES permit.

In addition to supplemental applications, any changes to the Project that reduce the ecosystem restoration amount, thereby reducing the Project's compensatory mitigation amount, must be approved by the Water Board's Executive Officer before those changes can be implemented (see Findings 21 and 22).

Habitat and Pond Breaching Considerations:

16. **Ecosystem Restoration and Benefits of Tidal Marsh Restoration and Ecotones**: Implementation of the proposed ecosystem restoration is expected to result in a significant contribution to tidal wetland restoration in the San Francisco Bay region. Tidal marsh restoration was recommended in multiple regional reports, including, but not limited to, *The Baylands and Climate Change: What We Can Do. Baylands Ecosystem Habitat Goals Science Update 2015*

prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project, California State Coastal Conservancy, 2015 (Goals Project), and the San Francisco Estuary Partnership's *Comprehensive Conservation and Management Plan* (CCMP) (1993; updated 2007 and 2016); both reports encourage the restoration of salt ponds to tidal marsh where feasible.

Restoring tidal wetland functions to former salt ponds will improve water quality in the South San Francisco Bay Estuary on a spatially significant scale with large contiguous habitat to maximize ecotonal or estuarine-terrestrial transitional habitat, and minimize non-native vegetation (if appropriate management efforts are taken to control non-native species) (Goals Project). In addition to habitat and water quality benefits, tidal marsh restoration will also help protect communities from floods, storms, and sea level rise by attenuating wave energy and buffering storm surges. Marsh systems that are tidally connected to the estuary improve water quality by filtering, fixing, and transforming pollutants. Marsh systems also protect beneficial uses by: providing nursery habitat and protection from predation for native fish species; creating significant biological productivity in estuarine and pelagic waters; and providing habitat for rare and endangered species such as the salt marsh harvest mouse (*Reithrodontomys raviventris*) and the California Ridgway's rail (*Rallus obsoletus*). Successful Project restoration would provide shallow open-water habitat for resident and migrating shorebirds such as Forster's terns, American avocets, Caspian terns, black-necked stilts, and the federally threatened western snowy plovers, and resident and migratory waterfowl such as mallards, greater and lesser scaup, northern shovelers, pintail, canvasback, and others.

Broadly speaking, tidal salt marshes in San Francisco Bay are currently in dynamic equilibrium with water levels in the Bay. The surfaces of these marshes can keep pace with rising sea levels if the Bay's suspended sediment supply remains relatively high, subsidence rates remain low, and restoration activities begin soon. While suspended sediment concentrations in the South Bay are relatively high, there has been an observed decrease in suspended sediment concentrations estuary-wide, beginning in 1999. At the same time, rates of sea level rise along the California coast are projected to increase in the future. This purpose of this project is to help address the uncertainty surrounding the future resiliency of vegetal tidal wetlands in the Estuary and provide the necessary flood protection to support an acceleration of tidal wetland restoration.

The proposed opening of salt ponds to tidal action is expected to restore tidal marsh on a large scale. Larger marshes tend to develop much more extensive networks of tidal channels, which provide habitat for fish and aquatic birds. These tidal channels also allow for the development of more diverse vegetative communities due to accumulation of sediment, and thus higher ground, along larger channels. Such diverse habitat with abundant internal high tide refugia will support much larger and more resilient population of species such as the State and federal endangered Ridgway's rail and salt marsh harvest mouse, and these animals are expected to have higher reproductive success and survivorship in larger, more heterogeneous marshes. In addition, having an established marsh in front of the FRM infrastructure will increase the resiliency of the shoreline to sea level rise.

The restoration will also provide more and higher quality estuarine-upland transitional habitat (ecotone) along the proposed levees in Ponds A12, A13, and A18. This habitat, located where tidal marshes transition into uplands with increasing elevation, provides habitat for a broad range of special-status plant species, increases habitat resiliency by providing space for marshes to retreat inland in the face of sea level rise, and provides refugia for animals such as the California Ridgway's rail and salt marsh harvest mouse when the marsh plain is inundated during very high tides.

Consistent with the above, the tidal marsh restoration and ecotone creation require the conversion of existing managed pond habitat. If undesired impacts are observed during the monitoring and adaptive management period, Phases II and III may be modified by adaptive management recommendations or conversion of pond habitat to tidal marsh may stop. This Order requires any modifications to Phase II and III implementation to be submitted to the Water Board Executive Officer for review and approval (see Finding 15 and Provision 1).

17. **Sea Level Rise (SLR)**: Climate change is expected to have dramatic effects on the regional sea level in San Francisco Bay. The National Research Council projects regional sea-level rise in San Francisco Bay to reach 0.92 ± 0.30 feet (range of 0.4 to 2.0 feet) by mid-century (2050) and 3.02 ± 0.83 feet[2] (range of 1.39 to 5.46 feet) by the end of the century (2100) (Goals Report). Under even the most modest projections, rising seas will likely change the existing coastal habitat by flooding lower elevation habitat, such as mudflats and marshes, while occupying higher elevation terrain landward (Goals Report). Sea level rise will also reduce drainage opportunities for tidally controlled water management infrastructure (e.g., tide gates) by raising the elevation of the lowest tides.

18. **Pond Restoration**: Ponds will be breached in specific locations to facilitate flow of water into and through the ponds, allow the tides to carry sediment into the breached ponds, and allow for the restoration of remnant channels in the pond bottoms. The following ground preparation actions will be involved in converting ponds to tidal marsh:

    - Drain the pond to the extent feasible. Each pond will be drained passively, so it may take several months to dry out; pumping would expedite the process and may be considered. Due to historic pond subsidence, some pond areas cannot be drained completely passively. This step is also dependent on temporal proximity to the western snowy plover nesting season and/or if access to the area can be obtained without impacts to plovers, as dried pond areas may invite snowy plover nesting. This Order identifies potential impacts to wildlife, including special status species such as the snowy plover and requires the Discharger to implement appropriate protective measures.

[2] Projections include one standard deviation (85% confidence interval)

- Construct wetland-upland transitional habitat (described below).
- Remove vegetation where needed (i.e., around the breach locations) to discourage salt marsh harvest mice from using the impact areas.
- Excavate pilot channels on the outboard side of the pond dikes.
- Construct ditch blocks.
- Breach the outboard dikes.

19. **Ponds A9-A15 Internal Pond Breaching**: Tidal restoration activities in Ponds A9-A15 are similar to those described for Pond A18 in Phase II. However, the internal berms in Ponds A9 to A15 require the reconnection of historical channels and restoration of hydraulic connections to the innermost ponds in the Project footprint. The breaches in Ponds A9 to A15 will be sized in a similar manner to those applied to the outboard dikes and will extend beyond the dike into the remnant historical channels. Existing internal berms may be lowered in some areas during the breach excavation to create wave breaks to limit wave action, enhance sedimentation, and create vegetated marsh habitat on the berm crests in the short term, while the ponds develop from mudflat to vegetated marsh. As Ponds A9-A15 are breached during Phases II and III, berms in adjacent ponds that have not been breached yet will be temporarily raised to provide increased flood protection inboard of the ongoing pond breaching actions. Assuming no slowdown between phases based on the MAMP, the current schedule will see the internal pond dikes breached throughout A19-A15 by the end of 2032.

Impacts and Mitigation:

20. **Project's Fill of Waters of the U.S.** The Project area contains approximately 2,916 acres of waters of the U.S., comprised of tidal salt marsh, tidal brackish marsh, muted tidal/diked marsh, tidal freshwater marsh, seasonal wetland, tidal open water, batch pond, managed pond, mud flat, and former salt ponds.

    In total, approximately 132.2 acres of permanent, fill-based impacts to waters of the U.S. will occur from the Project's construction activities. The permanent fill impacts include the FRM levee construction, ecotone creation, and ditch block placement (see Table 5).

Table 5: Summary of the Permanent Fill-Based Impacts by Project Component.

Feature	Permanent Impacts		
	Area (Acres)	**Length (Feet)**	**Fill (CY)**
FRM Levee and Artesian Slough Bridge	39.53	19,775	326,000
Stockpile Area within Future Ecotone Footprint (Ponds A12, A13, and A18)	41.61	5,980	702,000[3]
Ecotone Creation, Outside of Stockpile Area (A12, A13, and A18)[4]	49.91	5,747	1,232,000
Ditch Blocks	1.15	--	8,000
Total	**132.2**	**19,775**	**2,268,000**

The Project work will also cause permanent non-fill-based impacts to waters of the U.S., including berm excavation, outboard dike breaches and lowering, and a permanent FRM levee maintenance area (see Table 6).

[3] This amount is the maximum volume anticipated by the Discharger. The final volume may be less than what is stated in this Order, depending on available suitable material.
[4] This is the future ecotone area not accounted for within the stockpile footprint. Since the ecotone will run parallel to the FRM levee, the stockpile impact length overlaps with the FRM levee impact length.

Table 6: Summary of the Project's Non-Fill-Based Impacts.

Feature	Permanent Non-Fill Impacts		
	Area (Acres)	**Length (Linear Feet)**	**Fill (Cubic Yards)**
Phase I: Pond A12 southeastern berm excavation	0.740	19,607	
Phase I: Pilot Channel	7.8	4,373	-62,920
Phase I: Pond A12 and A18 outboard dike breaches and internal berm lowering	18.5	16,050	-89,105
Phase II: Ponds A9-A11 outboard dike breaches and internal berm lowering	20.0		0
Phase III: Ponds A13-A15 outboard dike breaches and internal berm lowering	20.0		0
Phases I to III: Permanent FRM Maintenance Easement	5.32	19,451	0
Total	**72.36**	**35,657**[5]	**-152,025**

Excavation activity in Pond A12 is necessary to eliminate two 90-degree bends in the levee and results in less FRM levee fill. This excavation work will permanently impact Pond A12 because approximately 0.74 acre of the existing levee will be removed. The inboard and outboard berm breaches during ecosystem restoration construction will cause permanent impacts, but these impacts will facilitate the return of tidal action to the former salt ponds. Additionally, a 5.32-acre area along the landward side of the new levee will be used as a permanent maintenance easement for the FRM levee following Project construction.

21. **Project's Net Loss of Waters of the U.S.** As stated previously, constructing the FRM levee prior to breaching the ponds is necessary to provide adequate flood protection before tidal action is restored to the ponds. In addition, sequenced pond breaching will facilitate tidal restoration by maximizing sediment accretion and hydraulic connectivity at strategic pond locations. The phasing will result in a net loss of waters during Phase I due to the lag time between the initiation of construction activities and the eventual return of tidal action to the ponds, ecotone creation, and anticipated tidal marsh restoration. There will be an approximate 8.76-acre net loss of waters of the U.S. with the currently proposed FRM levee alignment, although the currently

[5] Since the ecotone will run parallel to the FRM levee, the stockpile impact length overlaps with the FRM levee impact length.

projected loss could turn into a net gain of waters of the U.S. with an alternative landward alignment along Reaches 4 and 5 (see Att. C) (see Table 7).

Table 7: Summary of the Total Net Loss of Waters of the U.S. by Project Phase.

Created waters of the U.S.		Total Net Loss of waters of the U.S. after creation (acres)[6]
Description	**Area (Acres)**	
Pond A12 southeastern berm excavation	0.740	131.5
Ecotones below high tide line	36.0	95.46
Phase I Pond A12 and A18 outboard dike breaches and berm lowering	18.5	76.96
Phase II Ponds A9-A11 outboard dike breaches and berm lowering	20.0	56.96
Phase III Ponds A13-A15 outboard dike breaches and berm lowering	20.0	36.96
50 years of SLR	28.2	8.76
Total	**123**	**8.76[7]**
Total with landward alignment		**-61.24[8]**

This Order specifies minimum required mitigation the Discharger is required to complete to compensate for Project impacts, and deadlines for completing the mitigation (see Finding 22). Due to the need to phase construction activities and the uncertainty in the final levee alignment and associated impacts, final mitigation amounts may be greater than the minimum specified. The Order sets forth a process to determine final mitigation requirements.

If there is a minimal net loss of waters of the U.S. from the final FRM levee alignment, then the tidal restoration and ecotone creation, if fully implemented consistent with the deadlines in this Order, will serve as sufficient compensatory mitigation for the impacts from Project construction activities. If there is a net loss of waters of the U.S. from the final FRM levee alignment that is greater than the amount described above in Table 7, the Order requires the Discharger to propose and implement additional compensatory mitigation as described in the Provisions.

[6] The values in this column reflect the running net-loss total starting with 132.2 acres of fill-based impacts.
[7] This is the current total net loss estimate. Further investigation for future Project phases may yield a larger or smaller amount.
[8] This amount reflects approximately 70 acres of vegetation marsh that would be restored within the footprint of the former inactive sludge ponds (see Att. C). The negative shows there would be net gain of waters of the U.S.

When the Discharger submits supplemental applications for future Project work, total Project impacts will be taken into account to calculate the impacts to waters of the U.S., including temporary and permanent losses.

22. **Project Mitigation.** In total, the Project will restore up to 2,900 acres of tidal marsh by 2032 and create approximately 91.52 acres of ecotone by Year 2022, if the proposed restoration is successfully implemented.

Table 8: Summary of Restored Tidal Marsh and Ecotone Creation by Project Phase.

Phase	Maximum Anticipated Tidal Marsh Habitat Restored (Acres)	Ecotone Created (Acres)	Anticipated Construction (Year)
I	1,120[9]	91.52[10]	2022
II	900	0	2027
III	880	0	2032
Total	**2,900**	**91.52**	**--**

However, the anticipated tidal marsh habitat acreage, shown in Table 8, may not be successful if observed sediment accretion rates in the South Bay are significantly less than anticipated rates, or mitigation and monitoring results from the first set of breached ponds do not lead to a recommendation to breach Ponds A9-A15. Thus, there is uncertainty associated with future tidal marsh restoration and its sufficiency as mitigation for Project impacts. Therefore, the mitigation for the Project's total impacts will become more certain as the designs for future Phases are further developed and the monitoring results provide more information about the likelihood of success for the restoration activities.

Mitigation for Fill-Based Impacts and Habitat Conversion: The Project's impacts that cause a net-loss of waters of the U.S. will be mitigated by the Discharger as required in this Order and described in the Provisions. The Project will create new waters of the U.S. and convert the existing ponds to restored tidal marsh and created ecotones (Att. A, Figures 8 and 9).

The new waters of the U.S. created by the Project will mitigate the Project's permanent fill-based impacts. Removal of the existing berm at the southeast corner of Pond A12 will create approximately 0.74 acre of new open waters that will eventually be restored to tidal marsh.

[9] Under the FRM levee landward alignment for Reaches 4 and 5, this amount would be increased by a maximum of 70 acres to approximately 1,190 acres, which would bring the total anticipated tidal marsh restoration amount to 2,970 acres.

[10] Approximately 55.52 acres of the created ecotone will initially be above the high tide line after construction. After 50 years of the sea level rise, about 27.32 acres will be above the high tide line. The ecotone above the high tide line will enhance beneficial uses associated with tidal marshes by providing high tide refugia for special-status species.

Approximately 18.5 acres of new wetlands will be created from breaching Ponds A12 and A18. The created ecotones will result in approximately 28 acres of new waters of the U.S. based on the high sea level rise estimates calculated by the Discharger. In addition, pond breaching and berm lowering in Phases II and III will create approximately 40 acres of waters of the U.S. that are expected to become colonized with wetland vegetation. These non-fill-based impacts reduce the Project's overall net-loss of waters of the U.S. as described in Findings 21 and 22.

The remaining 8.76 acres of net fill will be mitigated by conversion of existing pond habitat to restored tidal marsh and created ecotone. The ecotone area will convert approximately 95.1 acres of current salt pond habitat to wetland-upland transitional habitat. The conversion will facilitate a tidal wetlands restoration that mimics historical San Francisco Bay landforms. The net benefit is an increase in tidal marsh habitat and its associated beneficial uses and functions, and a corresponding decrease in salt ponds. This habitat conversion is consistent with the Water Board's Basin Plan Wetland Fill Policy and California Wetlands Conservation Policy (see Findings 32 and 33). However, the habitat conversion's success and consistency with these policies is contingent upon the completion of all three Project phases, including the Project's ecosystem restoration components.

Mitigation for Non-Fill-Based Impacts: The Project's non-fill-based impacts will be mitigated by the corresponding conversion of pond habitat to restored tidal marsh and created ecotone, similar to the mitigation for the remaining net-fill (see above). The restored tidal marsh and created ecotones will mitigate the Project's non-fill based impacts because the size of the habitat conversion is sufficient to offset the net-fill amount, non-fill based impacts, and any temporal loss of functions and values that will occur from the time impacts occur to when the restoration is implemented. Similar to the fill-based impact mitigation, the non-fill-based mitigation is contingent upon completion of all three Project phases, including the proposed wetland restoration.

II. Reaches 1 to 3

The following sections discuss three of the five FRM levee reaches. The FRM levee alignment along Reaches 1 to 3 is generally acceptable, and additional design plans and documentation will be submitted to the Water Board for approval prior to the initiation of construction (see Finding 15). In addition to the FRM levee alignment along Reaches 1 to 3, the stockpiling locations in Ponds A12, A13, and A18 are generally acceptable. Conceptual drawings for the FRM levee alignment along Reaches 1 to 3 and the stockpiling areas have been submitted to the Water Board (Att. A).

23. **Reaches 1 to 3 Project Site.** Reach 1 is located in the southwestern corner of the Project site. Reach 2 continues at the end of Reach 1 where the levee reaches the southern portion of Pond A13 and turns east. Reach 3 continues east until Alviso Slough. Reaches 1 to 3 make up the Alviso FRM levee segment.

24. **Reaches 1 to 3 Construction Activities.** This Order authorizes levee construction, including excavation, dewatering, and fill placement, and the creation of ecotones in Ponds A12, A13, and A18, including the use of the ecotones' footprints in these ponds as staging/stockpiling areas.

Levee Construction: Levee construction timing and duration are constrained by weather conditions and listed species construction windows. The FRM levee will be constructed along approximately 9,345 linear feet of Reaches 1 to 3 (see Table 8).

Table 9: Summary of Reaches 1 to 3 Impacts Related to FRM Levee Construction.

Phase	Reach	Length (Linear Feet)	Description	Construction Event	Anticipated Construction (Year)
I	1	4,250	Alviso Marina to UPRR (Pond A13)	First	2018
	2	2,120	UPRR to Artesian Slough (Pond A16 & New Chicago Marsh)	Second	2019
	3	2,975			
Total		**9,345**		**--**	**--**

The design elevation for the new levee is 15.2 feet NAVD, after settlement. The earthen levee will increase the existing dike's height by approximately 10 feet (after settlement) and double the existing width. Upland fill material, or dredge material, will be used to construct the FRM levee and will originate from locations outside the Project area. Any dredge material used on-site will meet established screening criteria. Where the levee crosses the active UPRR line between Ponds A13 and A16, railroad floodgates will be installed. Concrete barriers will be installed on either side of the railroad right-of-way and tied into the earthen levees. Metal floodgates will be connected to the barriers and remain open during normal conditions and closed during flood conditions.

Ecotone Creation and Staging Area/Fill Stockpiling in Ponds A12, A13, and A18: The staging area and stockpiling area for fill material will be located in the future ecotone footprints in Ponds A12, A13, and A18. The fill used to construct the FRM levee will be imported from local sources and delivered by truck to the staging area. The water level in Pond A12 will be temporarily lowered during one construction season to dewater the stockpile footprint. Existing dike roads will be used as ingress and egress truck routes for the stockpiling areas. Any additional stockpile locations will be proposed in future permit applications.

The ecotones in Ponds A12 and A13 will be constructed after the adjacent FRM levee along Reaches 1 and 2 are completed. Under the current construction timeline, the ecotones in Ponds A12 and A13 will be constructed during Phase I's second and third construction event. The future ecotone in Pond A18 will not be created until the adjacent FRM levee along Reaches 4 and 5 is completed during the fourth construction event.

Dewatering: It is anticipated that the work area will need to be temporarily dewatered to construct the levee. If dewatering is necessary, dredge-locks or cofferdams may be constructed using earth levees or sheet piling. When possible, amphibious excavators, vibratory pile drivers, and other less-impactful equipment will be used.

Excavation: The existing dikes will be excavated below the mudline to meet FEMA levee standards. The excavator will place excavated dike and other fill material on both sides of the future Reach 1 alignment to create temporary dikes for dewatering the entire Reach 1 levee footprint. The excavator will proceed along the top of the dike for the entire length of Reach 1.

III. Maintenance and Management

25. **Replace and Realign Selected Utilities Infrastructure.** The only known utility crossing near the Reach 1 FRM levee alignment was identified as a storm drain. The storm drain is owned and operated by the City of San Jose. The storm drain's depth, diameter, and material are currently unknown. Prior to construction, the storm drain's location and condition will be identified. The storm drain will be protected in place during construction.

26. **Operation and Maintenance Plan.** The Discharger will prepare an Operation, Maintenance, Repair, Replacement, and Rehabilitation (O&M) Plan to describe ongoing activities that will be implemented along the entire FRM levee and ecotones. The District will be responsible for implementing the O&M Plan for the FRM levee after the levee construction is complete. The O&M Plan will include FRM levee O&M activities that will be performed in order to meet the Corps' levee safety program standards and FEMA certification requirements. The following O&M activities will be performed on the FRM levees:

    - Trash and anthropogenic debris removal along levee slopes and where it is causing obstruction in culverts or other problems
    - Repairs on levee due to damage by small burrowing mammals, runoff/erosion, storm activities, or other factors
    - Repairs along concrete flood wall structures (if included in the plan) and other features, such as bridges and culverts
    - Levee inspections

- Graffiti removal
- Access improvements and upkeep
- Vector monitoring (presence of mosquitos and their larvae)
- Vegetation management—the levee design will include vegetation to control erosion on the Bayward and landward side slopes, but some mowing will be needed on the levee side slopes within 12 to 15 feet of the levee crown. In addition, within a narrow 15-foot or less strip of ecotone fill along the edge of the exposed levee crest, vegetation will be managed on the ecotone in a similar manner as on the FRM levee. The following vegetation management activities will be performed by the Discharger on the FRM levee and ecotones:

    a) Regular mowing of the levee side slopes. Regular mowing will be performed annually. Mowing will proceed from the top, close to the crown, where habitat is of lowest quality, downward toward high-quality habitat so that wildlife that may be using the mowed area are encouraged to move downslope from the noise and movement of the mower..

    b) No woody plant species greater than two inches in diameter will be allowed to become established on the levees, to prevent roots from damaging the structural integrity of the levee and prevent mature woody plants from serving as raptor perches. Any woody vegetation that germinates in the higher-elevation mowing zone will be managed by mowing. Below the mowing zone, any wood plant removal that becomes necessary will be performed by hand; such hand-removal is expected to be necessary about once every few years.

27. **Monitoring and Adaptive Management Plan (MAMP).** The *South San Francisco Bay Shoreline Study, Monitoring and Adaptive Management Plan for Ecosystem Restoration* (Corps, September 2015) (MAMP) provides a feasibility-level monitoring and adaptive management plan for the Project. The MAMP identifies potential monitoring activities, outlines generally how results from the monitoring will be used to assess Project success, provides estimated costs, and recommends adaptive management actions, if such actions are necessary to achieve the desired ecosystem restoration objectives. The MAMP also specifies the parties responsible for monitoring and adaptive management activities. The Project's MAMP is presented in four steps that capture the iterative adaptive management process:

    1) Adaptive management planning;
    2) Monitoring;
    3) Regular assessments; and

4) Decision making.

The adaptive management process outlined in the MAMP incorporates all four of these steps to arrive at a decision that increases the likelihood of achieving the desired habitat restoration success given Project uncertainties. The iterative process that will be used in adaptive management is shown graphically in the MAMP (Att. C, Figure 2). The Project's MAMP used the SBSPRP's Adaptive Management Plan (AMP) conceptual ecological model that provided a linkage between Project actions and expected system response.

Adaptive Management Planning: The MAMP lists the Project objectives, known constraints and considerations, and identifies related uncertainties in future conditions. The Project uses the SBSPRP tidal habitat conceptual model, which is directly relevant to the Project's desired habitat type and ecosystem restoration objectives.

Monitoring: The purposes of monitoring are to assess progress towards Project objectives, detect early signs of potential problems, and reduce uncertainties. The following primary monitoring topics were developed to address the Project's key uncertainties that were identified in the MAMP: 1) Sediment dynamics 2) Bird use of changing habitats 3) Non-avian species 4) Invasive and nuisance species and 5) Ecotones. For each key uncertainty, restoration targets (success criteria) were also developed to identify the desirable outcome. Monitoring metrics were then defined to measure each restoration target. A complete list and description of the monitoring topics, targets, and metrics associated with ecosystem restoration objectives are shown in Appendix B, Table 2. In addition, each monitoring metric is detailed in terms of monitoring methods, locations, frequency, and duration in order to develop a cost estimate, as shown in Appendix B, Table 3. The MAMP acknowledges that the monitoring method summaries were intended to provide reasonable cost estimate but do not fully describe the monitoring regime. Consistent with MAMP Sections 3.1 and 3.3, this Order requires the Discharger to develop a monitoring plan with detailed triggers, metrics, methods, protocols, timing, and responsible parties prior to the start of monitoring (see Provision 34). This Order also requires the Discharger to monitor and adaptively manage the ponds that are restored to tidal action to ensure the Project's ecosystem restoration component is successful and mitigates the Project's permanent impacts to waters of the U.S. and submit reports to the Water Board Executive Officer for approval.

To guide long-term management of the ponds, this Order requires that the Discharger continue to implement and report on applied studies. These studies will focus on the sources of uncertainty associated with ecosystem restoration, flood risk management, and public access that were identified in the MAMP (Att. B, Section 2.4). These sources of uncertainty were previously identified so that monitoring could be targeted to reduce these uncertainties and guide future actions, including adaptive management. This Order requires the Discharger to submit monitoring reports to the Water Board's Executive Officer for the following monitoring topics and categories identified in the MAMP.

Regular Assessments: Regular assessments will be used to compare the results of the monitoring efforts to the desired Project performance targets to the corresponding management trigger. Each management trigger is a threshold that indicates, when reached, that the Project may be diverging from a restoration target. The triggers are intended to act as a warning signal before significant impacts to the system occur. This advance notice will provide the time needed to investigate the causes of the divergence and take action, as necessary, to put the system back on track. The management triggers and restoration targets will be reviewed and updated regularly as additional information becomes available during the monitoring period.

The MAMP outlines the assessment process, acceptable variances between monitoring results and targets, the frequency and timing for comparison of monitoring results to the selected targets, and assessment documentation. If the regular assessments indicate the ecosystem restoration system is not performing well, as defined by the restoration targets, then the corresponding management trigger may lead to adaptive management action. This Order requires revisions to the regular assessments and management triggers to be submitted to and approved by the Water Board's Executive Officer.

Adaptive management actions will be implemented when the ecosystem restoration areas are not progressing towards the restoration targets and a management trigger has been reached. The first action will typically be to assess available monitoring data and consult with external and internal experts to inform subsequent management actions. Potential management actions are categorized in the MAMP as the following: 1) as-needed assessments; 2) construction (adjustments to the design); and 3) changes to operations and maintenance. Changes to the restoration phasing (adaptive implementation) are also a potential outcome, but those actions are not included as cost-shared activities; and 4) additional data and analysis. This Order requires any adaptive management actions to be clearly detailed and presented relevant supporting documentation, including monitoring data, restoration targets, management triggers, and a detailed description of the proposed actions, to the Water Board's Executive Officer for review and acceptance prior to implementation (see Provisions 1 and 34).

28. **Construction General Permit.** The Discharger is required to seek coverage under and comply with, or oversee that its contractors seek coverage and comply with, the statewide General Permit for Discharges of Storm Water Associated with Construction Activities (Order No. DWQ-2009-0009, as amended, and as may subsequently be reissued) (Construction General Permit).

29. **Monitoring and Technical Reports.** All monitoring and technical reports required in this Order are required pursuant to CWC section 13267. The burden of preparing these reports, including costs, bears a reasonable relationship to the benefits to be obtained from the reports and monitoring. Specifically, the monitoring and technical reports will demonstrate protection of beneficial uses during construction and maintenance projects, and verify the success of efforts to

mitigate impacts. The technical reports will be used in combination with the MAMP to inform future actions and opportunities to maximize tidal restoration acreage and likelihood of restoration success.

IV. Other Findings

Laws, Regulations, and Policies

30. **California Environmental Quality Act (CEQA).** CEQA requires all discretionary projects approved by public agencies to be in full compliance with CEQA, and requires a lead agency to prepare an appropriate environmental document for such projects. The Conservancy, as the lead agency, certified a combined Interim Feasibility Study and Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) (Joint EIS/EIR) (HDR, July 2015) for the Project on September 24, 2015.

    The Joint EIS/EIR found several potential impacts that are under the Water Board's purview and jurisdiction. These include potential impacts to: (1) geology; (2) hydrology and water quality; (3) aquatic biological resources; (3) terrestrial biological resources; (4) hazardous materials; and (5) hydrology and water quality. The EIR also found that the mitigation measures proposed therein would mitigate all of these impacts to less than significant levels, including FRM levee O&M activities and ecosystem restoration monitoring and adaptive management.

    The Water Board, as a responsible agency under CEQA, has considered the Joint EIS/EIR and finds that in combination with the requirements of this Order, impacts during the construction, post-FRM levee construction O&M activities, and post-pond breaching monitoring and adaptive management actions of the Project, including any potential FRM levee alignment changes along Reaches 4 and 5 that are landward of the currently proposed alignment, that are within the Water Board's purview and jurisdiction have been identified and will be mitigated to less-than-significant levels. This Order includes conditions and mitigation measures that will substantially lessen the Project's impacts on the environment. The need for to provide compensatory mitigation for impacts from the Project design is addressed in this Order.

31. **Water Quality Control Plans.** The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) was duly adopted by the Water Board and approved by the State Water Resources Control Board (State Water Board), U.S. EPA, and the Office of Administrative Law where required. The Basin Plan is the Water Board's master water quality control planning document. It designates beneficial uses of receiving waters, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed by the Plan.

    Existing and potential beneficial uses of waters within the Project area include the following:

- **Alviso Slough:** Estuarine Habitat (EST), Fish Migration (MIGR), Preservation of Rare and Endangered Species (RARE), Water Contact Recreation (REC-1), Noncontact Water Recreation (REC-2), and Wildlife Habitat (WILD)

- **Artesian Slough:** EST, RARE, REC-1, REC-2, and WILD

- **San Francisco Bay:** Section 2.2.1 of the Basin Plan indicates that the beneficial uses of any specifically identified water body generally apply to its tributary streams. Because the former salt ponds are hydrologically connected to San Francisco Bay, the beneficial uses that are identified for San Francisco Bay also apply to the former salt ponds. These beneficial uses are: Commercial and Sport Fishing (COMM), EST, Industrial Service Supply (IND), MIGR, Navigation (NAV), RARE, REC-1, REC-2, Shellfish Harvesting (SHELL), Fish Spawning (SPWN), and WILD

- **Tidal Wetlands:** COMM, EST, MIGR, RARE, REC-1, REC-2, SPWN, and WILD

32. **Basin Plan Wetland Fill Policy.** The Basin Plan Wetland Fill Policy (Fill Policy) establishes that there is to be no net loss of wetland acreage and value, and a long-term net gain, when a project and any proposed mitigation are evaluated together, and that mitigation for wetland fill projects is to be located in the same area of the region, whenever possible, as the project. The Fill Policy further establishes that wetland disturbance should be avoided whenever possible and, if not possible, should be minimized and only after avoidance and minimization of impacts should mitigation for lost wetlands be considered. The Water Board incorporated U.S. EPA's Section 404(b)(1) Guidelines into the Basin Plan for determining the circumstances under which dredging or filling of wetlands, streams, or other waters of the U.S. may be authorized. The Water Board must ensure that all projects meet State water quality standards, including, but not limited to, water quality objectives, existing and potential beneficial uses, and the State's Anti-degradation Policy. Requirements of this Order implement the Fill Policy.

33. **California Wetlands Conservation Policy.** The goals of the California Wetlands Conservation Policy (Executive Order W-59-93, signed August 23, 1993) include ensuring "no overall net loss" and achieving a "…long-term net gain in the quantity, quality, and permanence of wetland acreage and values…."

    Senate Concurrent Resolution No. 28 states that "[i]t is the intent of the legislature to preserve, protect, restore, and enhance California's wetlands and the multiple resources which depend on them for benefit of the people of the State." Section 13142.5 of the CWC requires that the "highest priority shall be given to improving or eliminating discharges that adversely affect…wetlands, estuaries, and other biologically sensitive areas."

    The Water Board applies the California Wetlands Conservation Policy to waters that have the potential to be restored or converted to tidal marsh and related tidal marsh refugia in part

because 79 percent of tidal marsh (150,000 acres) and 42 percent of tidal flats (21,000 acres) in San Francisco Bay were lost to diking and filling between 1800 and 1998 (Goals Project).[11]

Requirements of this Order implement the California Wetlands Conservation Policy.

34. **California Anti-Degradation Policy.** In the Basin Plan, the Anti-Degradation Policy (State Board Resolution Board No. 68-16: Statement of Policy with Respect to Maintaining High Quality of Waters in California) is applied to cases where water quality is better than that prescribed by the Basin Plan's water quality objectives. This policy is aimed at protecting relatively uncontaminated aquatic systems where they exist and preventing further degradation. The state's Anti-Degradation Policy is consistent with the federal Anti-degradation Policy. This Order complies with the federal and State Anti-Degradation Policies because it will enhance the water quality of waters in the Project area by creating tidal marshes (see Finding 16) and ensures protection of existing water quality by requiring compliance with Basin Plan water quality objectives.

35. **Endangered Species Acts.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). The Discharger is responsible for meeting all requirements of the applicable Endangered Species Acts. As applicable, the Discharger shall utilize the appropriate protocols, as approved by the U.S. Fish and Wildlife Service (USFWS) and stated in the USFWS Coordination Act Report and required in this Order, to ensure that Project activities do not adversely impact water quality or the beneficial uses of Alviso Slough, Artesian Slough, and other waters of the U.S. as referenced in Finding 32.

36. **Special-Status Species.** The Discharger requested formal consultation with the USFWS, pursuant to section 7 of the Endangered Species Act (ESA), regarding the Project's impacts to the federally endangered California clapper rail (Rallus longirostris obsoletus), endangered salt marsh harvest mouse (Reithrodontomys raviventris), threatened Pacific coast population of the western snowy plover (Charadrius alexandrines nivosus), and endangered California least tern (Sternula antillarum brown). The USFWS responded to the Discharger's consultation request in the Biological Opinion on the South San Francisco Bay (South Bay) Shoreline Phase 1 Study in Santa Clara County, California (BO), dated April 27, 2015. The BO included Conservation Measures, Reasonable and Prudent Measures, Terms and Conditions, and an Incidental Take Statement that the Discharger, Conservancy, District, and City will comply with during Project construction and adaptive management activities.

[11] The amount of tidal marsh, and tidal flats lost between 1900 and 1998 are from the Goals Report.

The Discharger requested written concurrence from National Marine Fisheries Service (NMFS), pursuant to section 7 of the ESA, regarding the Project's impacts to the federally threatened Central California Coast steelhead (*Oncorhynchus mykiss*) and North American Green Sturgeon southern Distinct Population Segment (DGS) (*Acipenser* medirostris) and their critical habitat. The NMFS responded to the Discharger's consultation request in the *Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the South San Francisco Bay Shoreline Phase I Study*, dated May 19, 2015. In their response to the Discharger's concurrence request, NMFS agreed with the Discharger's assessment that the Project is not likely to adversely affect species ESA-listed fish and designed critical habitat. Part of NMFS' finding is based on the proposed measures to protect listed fish and the aquatic environment.

Public Noticing, Records, and Fees

37. **Notification of Interested Parties.** In accordance with CWC sections 13263(a) and 13241, the Water Board, after considering this matter at a public hearing, has prescribed requirements as to the nature of the proposed discharge. These requirements implement the Water Board's relevant water quality control plans and policies and take into consideration the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, and the need to prevent nuisance. The Water Board has notified interested parties of its intent to issue waste discharge requirements and water quality certification for this discharge.

38. **Public Review.** Upon receipt of future applications for additional Project construction activities, including additional Phase I, Phase II, and III activities, a public notice will be provided for a 30-day period. The public notice of the applications will be posted on the Water Board's website: http://www.waterboards.ca.gov/sanfranciscobay/public_notices/

39. **Consideration of Public Comment.** The Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Additional public meetings to hear and consider all comments pertaining to future discharges may be scheduled when supplemental applications for these future discharges are received by the Water Board (see Finding 15).

40. **Records Management.** This Project file is maintained at the Water Board under CIWQS Place No. 813084 and Regulatory Measure No. 413855.

41. **Fees for Dredge and Fill Projects.** The fee amount for this Order shall be in accordance with the current fee schedule, per CCR), Title 23, Division 3, Chapter 9, Article 1, section 2200(a)(3). The Water Board understands, based on information from the Corps and the Non-Federal Sponsors, that the Non-Federal Sponsors are responsible for the fee.

42. **Waste Discharge Requirements (WDRs).** Pursuant to 23 CCR sections 3857 and 3859 the Water Board is issuing WDRs and Water Quality Certification for the activities proposed in this

Order. Pursuant to CWC section 13263 and Title 23, section 3857 of the California Code of Regulations (CCR), the Water Board is issuing WDRs to regulate the proposed discharge of excavation, dredge, and fill into waters of the U.S. The Water Board considers WDRs necessary to adequately address impacts and mitigation to beneficial uses of waters of the U.S. from the Project, to meet the objectives of the California Wetlands Conservation Policy (Executive Order W-59-93), and to accommodate and require appropriate changes over the life of the Project, including during its construction and in subsequent Phases.

43. **Water Quality Certification.** Any discharge from the Project consistent with the Application and as conditioned in this Order will comply with the applicable provisions of CWA sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards) and with other applicable requirements of State law. The Project will result in discharge of dredge and fill materials into waters of the U.S. and of the State. The CWA (33 U.S.C. §§ 1251-1387) was enacted "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." (33 U.S.C. § 1251(a).) Section 401 of the CWA (33 U.S.C. §1341) requires every applicant for a federal license or permit that may result in a discharge into navigable waters to provide the licensing or permitting federal agency with certification that the Project will be in compliance with specified provisions of the CWA, including water quality standards and implementation plans promulgated pursuant to CWA section 303 (33 U.S.C. § 1313). CWA section 401 directs the agency responsible for certification to prescribe effluent limitations and other limitations necessary to ensure compliance with the CWA and with any other appropriate requirement of state law. CWA section 401 further provides that state certification conditions shall become conditions of any federal license or permit for the Project.

IT IS HEREBY ORDERED that pursuant to the provisions of CWA 401 and Division 7 of the CWC, related regulations, and guidelines adopted thereunder, the Discharger, its agents, successors, and assigns shall comply with the following:

A. **Discharge Prohibitions.**

1. The discharge of wastes, including debris, rubbish, refuse, or other solid wastes into surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including floodplains, is prohibited.

2. The discharge of floating oil or other floating materials from any activity in quantities sufficient to cause deleterious bottom deposits, turbidity, or discoloration in surface waters is prohibited.

3. The discharge of silt, sand, clay, or other earthen materials from any activity in quantities sufficient to cause deleterious bottom deposits, turbidity, or discoloration in surface waters is prohibited.

4. The fill activities subject to these requirements shall not cause a nuisance as defined in CWC section 13050(m).

5. The groundwater in the vicinity of the Project shall not be degraded as a result of the Project activities or placement of fill for the Project.

6. The discharge of materials, which are not otherwise regulated by a separate NPDES permit or allowed by this Order, to waters of the U.S. is prohibited.

7. Directional drilling in the Project is prohibited.

8. This Order prohibits any dewatering, diversion, or discharge before the Executive Officer accepts, in writing (including via electronic mail), a Dewatering Plan that meets the requirements of this Order.

9. This Order prohibits the alignment of any utilities, or maintenance of existing utility lines in the Project area, in a manner that will create an obstacle to flow or destabilize the ponds or adjacent creeks.

10. Equipment shall only be operated within the footprint documented in the work zone describe herein, and as approved by the Water Board's Executive Officer. No fueling, cleaning, or maintenance of vehicles or equipment shall take place within any areas where an accidental discharge to waters of the U.S. may occur.

B. **Provisions.**

1. The Discharger shall comply with all Prohibitions and requirements of this Order immediately upon adoption of this Order or as otherwise provided below. The Discharger shall fully implement all requirements of this Order, including all plans accepted by the Water Board or the Executive Officer. Any significant alterations to the Project, as defined in Finding 15, shall be submitted to the Water Board's Executive Officer, or this Water Board, for review and approval prior to their implementation. If the Water Board does not accept a significant alteration to the Project prior to its implementation, the Discharger will be considered in violation of this Order and may be subject to Water Board enforcement actions.

2. All plans and reports required under this Order shall be submitted and acceptable to the Water Board's Executive Officer.

3. The Project shall be constructed in conformance with the description herein, the Project application materials, and the 100 percent Design Plans that shall be submitted prior to the initiation of Project construction.

4. All work performed within waters of the U.S. shall be completed in a manner that minimizes impacts to beneficial uses and habitat. Measures shall be employed to minimize disturbances that will adversely impact the water quality of waters of the U.S.

5. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete Project implementation. The Project site shall be stabilized through incorporation of appropriate BMPs, including the successful establishment of native grass vegetation, to compensate for impacts to wildlife habitat values and to prevent and control erosion and sedimentation. The Discharger shall revegetate Reach 1 based on the 100 percent Design Plans and Planting Plan.

6. The discharge shall not cause a violation of any water quality standard for receiving waters adopted by the Water Board or State Water Resources Control Board (State Water Board) as required by the CWA and regulations adopted thereunder. If more stringent water quality standards are promulgated or approved pursuant to CWA section 303, or amendments thereto, the Regional Water Board may revise or modify this Order in accordance with the more stringent standards. Pond dewatering discharges, accumulated groundwater or stormwater removed during dewatering of excavations, and diverted pond and stormwater flows shall not be discharged to waters of the U.S. without meeting the receiving water objectives in the Basin Plan.

7. **Construction General Permit**. The Discharger shall seek coverage under and comply with, or ensure that its contractors seek coverage and comply with, the statewide General Permit for Discharges of Storm Water Associated with Construction Activities (Order No. DWQ-2009-0009, as amended by Order Nos. 2010-0014-DWQ and 2012- 006-DWQ), and as may be subsequently amended or reissued (Construction General Permit). All work performed within waters of the U.S. shall be completed in a manner that minimizes impacts to water quality and the beneficial uses of Alviso Slough, Artesian Slough, tidal wetlands, and other waters of the U.S.

8. **Receiving Water Limitations.** Dewatering discharges, accumulated groundwater or stormwater removed during dewatering of excavations, and diverted creek and stormwater flows shall not be discharged to waters of the U.S. without meeting the following discharge and receiving water limitations. All monitoring records at the Project site shall be maintained at a location to be designated in the Dewatering Plan and shall be made available upon request by Water Board staff.

a. pH - the instantaneous discharge pH shall be in the range of 6.5 to 8.5, and controllable water quality factors shall not cause changes greater than 0.5 units in receiving water pH levels.

b. Discharge Dissolved Oxygen - the discharge dissolved oxygen concentration shall be no less than 5.0 milligrams per liter (mg/L).

c. Discharge Dissolved Sulfide - the discharge-dissolved sulfide shall not be greater than 0.1 mg/L.

d. Receiving Water Turbidity - the discharge turbidity shall not be greater than 10 percent more than receiving water turbidity, measured as nephelometric turbidity units (NTU), in areas where natural turbidity is greater than 50 NTU (daily average). In areas where natural turbidity is less than or equal to 50 NTU, the discharge shall not cause an increase in receiving water turbidity of greater than 5 NTU (daily average). All Project discharge plans shall identify an acceptable location or locations at which to measure background turbidity. The Discharger shall monitor receiving water and discharge turbidity at least one time every 8 hours on days when discharges from excavations or any other dewatering processes may occur.

e. Receiving Water Temperature - the receiving water shall not be increased by more than 5°F (2.8°C) above natural receiving water temperature.

f. Nutrients - the receiving waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

9. **Dewatering Plan**. The Discharger shall prepare a Dewatering Plan acceptable to the Water Board's Executive Officer. The plan shall be submitted to the Water Board's Executive Officer at least 30 days prior to each Project phase in which dewatering is proposed or may be needed. The plan shall include the area to be dewatered, timing of dewatering, and method of dewatering to be implemented. All temporary dewatering methods shall be designed to have the minimum necessary impacts to waters of the U.S. to isolate the immediate work area. All dewatering methods shall be installed such that natural flow is maintained outside the Project area. Any temporary dams or diversions shall be installed such that the diversion does not cause sedimentation, siltation, or erosion within or upstream or downstream of the Project area. All dewatering methods shall be removed immediately upon completion of Project activities. The Discharger shall implement, or ensure that its contractor implements, the Dewatering Plan and the discharge requirements throughout the Project site.

10. **Groundwater Management Plan**. The Discharger shall prepare a Groundwater Management Plan (GMP) acceptable to the Water Board's Executive Officer. The GMP shall be submitted

to the Water Board's Executive Officer no later than 90 days prior to start of any construction event in which groundwater dewatering is planned or needed. In construction areas that have a likelihood of coming into groundwater that may be contaminated, the Groundwater Management Plan shall meet the standards of the VOC and Fuel General Permit.

11. **Quality Assurance Project Plan (QAPP and Fill Quality Report)**. The Discharger shall prepare and implement a Quality Assurance Project Plan (QAPP) acceptable to the Water Board's Executive Officer. The QAPP shall provide procedures and screening guidelines to reuse imported soil at the Project area. Existing guidance for the beneficial reuse of sediments establishes numeric screening guidelines for the placement of sediments in direct contact with water or the burial of sediments beneath a cover layer. The QAPP shall be submitted to the Water Board's Executive Officer for review and approval not later than 90 days before Phase I construction is initiated.

    The Discharger shall characterize the quality of all fill material proposed for use as fill prior to placement at the Project area. The Discharger shall not import contaminated soil for use at the Project area nor reuse any contaminated soil excavated within the Project area that does not meet acceptance screening level criteria for its intended reuse (see below). Soil to be transported offsite shall be for non-hazardous or hazardous landfill disposal, as appropriate.

    Not later than 60 days prior to placing any imported or excavated soil fill material at the Project area, including all placement of fill in the ecotones' footprints, on levees, and at any other location where the fill is a discharge to or has the potential to discharge to any waters of the U.S. in the Project area, the Discharger shall submit a technical report acceptable to the Executive Officer. The technical report shall demonstrate that the chemical concentrations in the imported or excavation soil fill comply with the protocols specified in the following documents that are appropriate to each source of material:

    - *Upland Soil*: If upland soil from upland borrow sites is imported for use in future Project areas, the following conditions shall apply and be subject to the Water Board's Executive Officer approval: (i) Imported soil from upland borrow sites must be determined suitable based on the procedures and screening guidelines contained in a QAPP approved by the Water Board's Executive Officer; and (ii) if the materials are proposed for levee construction, a report characterizing the material's suitability for levee construction shall be submitted at least 30 days prior to material placement in the stockpile areas.

    - *Riverine Material*: The Water Board May 2000 staff report *Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines*, or the most current revised version. Water Board staff shall review and approve data characterizing the quality of all material proposed for use as fill prior to placement of fill at any of the levee, marsh, or channel areas at the Project site. Modifications to these procedures may be approved by the Executive Officer on a case-by-case basis, pending the Discharger's ability to

demonstrate that the imported fill material is unlikely to adversely impact beneficial uses. Soil originating from non-Bay locations shall modify the toxicity tests set forth in the Guidelines for Implementing the Inland Testing Manual in the San Francisco Bay Region (DMMO Reuse Guidance) so that the measured toxicity is representative of the conditions that will be seen when the sediment is reused, including conditions when the soil is dried and wetted so that oxidation-reduction (redox) properties are changed. Any proposed modifications to toxicity tests set forth in the DMMO Reuse Guidance shall be submitted to the Water Board's Executive Officer for review and acceptance prior to implementation.

- *Dredged Material*: If dredged sediment is imported for use in future Project areas, the following conditions shall apply and be subject to the Water Board's Executive Officer approval: (i) Water Board staff shall review and approve data characterizing the quality of all dredged material (Bay sediments) proposed for use as fill prior to placement at any Project area. Sediment characterization shall follow the protocols specified in the DMMO Reuse Guidance, including case-by-case modifications approved by the Water Board's Executive Officer (see above); (ii) if the material is proposed for levee maintenance, a levee inspection report shall be submitted at least 30 days prior to dredge material placement; and (iii) if applicable, a work plan and schedule for making any repairs or improvements shall also be submitted prior to dredge material placement.

- *Inactive Legacy Biosolids*: If legacy biosolids from the RWF legacy ponds (placement in ponds dates from 1962-1974) are used for the ecotone construction or stockpiling within the ecotone footprint, the following conditions shall apply and be subject to the Water Board's Executive Officer approval: (i) biosolids used in the ecotones shall not be exposed; (ii) biosolids used in the ecotones shall be covered with a minimum of 3 feet of suitable cover material and engineered to ensure burial; (iii) biosolids to be reused in ecotone construction shall meet or be below the "foundation material" screening levels for contaminants (e.g., metals, TPH, VOCs, SVOCS, PCBs) in the DMMO Reuse Guidance and be at or below leachability for non-landfill conditions; and (iv) any biosolids not reused in the ecotones or that do not meet screening levels shall be consolidated and capped within the existing inactive RWF pond area, subject to Water Board action now covered by this Order..

12. **Maintenance**. Construction activities necessary for the on-going maintenance of existing levees and infrastructure, may include the following activities: Trash and anthropogenic debris removal; repairs on levee due to damage by small burrowing mammals, runoff/erosion, storm activities, or other factors; levee inspections; graffiti removal; access improvements and upkeep; vector monitoring (presence of mosquitos and their larvae); or vegetation management.

Mitigation and Monitoring Requirements

13. **Pond and Ecotone Monitoring**. The ponds and ecotones shall be monitored for a minimum 10-year period following each pond-breaching event, as specified in the MAMP, to ensure they are performing as anticipated, and to allow for adaptive management if necessary.

14. **Annual Monitoring Reports**. The Discharger shall prepare annual letter reports (both electronic and hard copy) acceptable to the Water Board's Executive Officer. The annual reports shall be submitted to the Water Board by January 31 each year over the 10-year monitoring period that follows each pond-breaching event. The reports shall document the pond's progress towards achieving full tidal marsh restoration and meeting wetland mitigation's progress towards achieving the final success criteria specified in MAMP, as revised. The report shall address any signs of insufficient hydrology, poor survival or growth of vegetation, and excessive erosion or deposition of sediment in and around the wetland and ecotone areas. If the annual report indicates the final success criteria in MAMP may not be achieved, the Discharger shall submit a Corrective Action Plan to the Water Board. If an annual report indicates the recommended corrective action may be to discontinue pond breaching and future Phases, then the Discharger shall revise the CMMP to mitigate the Project's unmitigated permanent fill impacts to Waters of the U.S. and submit the revised CMMP to the Water Board's Executive Officer for review and acceptance;

15. **Contingency Mitigation and Monitoring Plan (CMMP)**. The Discharger shall prepare a Contingency Mitigation and Monitoring Plan (CMMP) acceptable to the Water Board's Executive Officer. The CMMP shall be submitted not later than January 31, 2020 (the year that construction along Reaches 4 and 5 is anticipated). The CMMP shall provide for a minimum mitigation amount sufficient to ensure no net loss of area and function, including temporal loss, of waters of the U.S. resulting from the Project. Updates to the CMMP shall be submitted if all or a portion of the Project's ecosystem restoration components is not implemented. Any updates to the CMMP shall be submitted to the Water Board's Executive Officer no later January 31 in each year that changes to the Project described in the Order are proposed. The CMMP shall include the following:

    a. A mitigation proposal, workplan, monitoring plan, performance standards, and other information, as appropriate, sufficient to ensure providing appropriate mitigation of permanent and temporal losses of functions and values of waters of the U.S. resulting from Project implementation, and to ensure that the Project results in no net loss, and a long-term net gain, in wetland and waters area, functions, and values.

        At a minimum, the CMMP shall propose the creation of an area of waters equivalent to the net loss of area resulting from the Project. In addition, the CMMP shall propose additional mitigation to address delays of greater than 5 years from the schedules listed in the Findings in implementation of the Project's tidal restoration.

The Water Board may require a lesser or greater amount of area than the currently anticipated net loss of waters of the U.S. based on changes in the factors listed in Findings 21 and 22, such that the size and scope of the mitigation project shall be appropriate for the Project's impacts.

b. The mitigation proposal, work plan, monitoring plan, and performance standards shall contain, but are not necessarily limited to, the following:

   i. Annual performance criteria and final success (metrics) that may be used to assess establishment of the mitigation area's vegetation and hydrology. Annual performance criteria may include, but are not limited to, the following: percent cover, maximum percent cover for non-native species, percent survival of plants, and target plant heights. Final success criteria are used to assess the mitigation project's success at the end of a monitoring period. Additional metrics may also be considered.

   ii. A summary of maintenance activities, including irrigation, weeding, and replanting of dead or missing vegetation; a schedule for implementing maintenance activities; the plant palette selected for replanting, including pounds per acre of seeds, numbers and sizes of container plants, and sources of all plant material; and

   iii. Contingency measures to be implemented in the event that annual performance criteria or final success criteria are not attained, or mitigation wetlands do not attain jurisdictional status at the end of the initial monitoring period.

The CMMP shall incorporate the reporting requirements in Provisions 13, 14, 16, and 17 to 28.

16. **Log of Impacts**. The Discharger shall maintain an Impacts Log to track Project activities including the start dates of impacts to waters of the U.S. and the associated mitigation activities. The Discharger shall make the Impacts Log available for review by Water Board staff upon request. The Impacts Log shall include, but not be limited to, the start dates of the following Project milestones:

   a. Excavation and grading;

   b. Pond dewatering;

   c. Groundwater management;

d. Completion of each Project component as described in Findings 10 to 12; and

e. Hydroseeding.

Reporting Requirements

17. **Reports**. All reports pursuant to these Provisions shall be prepared under the supervision of suitable professionals registered in the State of California.

19. **Water Quality Monitoring**. The Discharger shall report any water quality monitoring data that are not in compliance with this Order to the Water Board within 24 hours via telephone and shall follow up with a written report within 14 days. The written report shall provide the following:

    a. Discharge and receiving water measurements for the water quality parameter(s) collected during the non-compliance event;

    b. The location, duration, and likely cause of the non-compliance event;

    c. All actions taken to remedy non-compliance immediately after identifying the non-compliance event and to mitigate for any adverse impacts caused or contributed to by the non-compliance event; and

    d. All actions taken to prevent a similar non-compliance event in the future.

20. **Technical Advisory Committee (TAC)**. A TAC shall be organized and convened through a public process by the Discharger and shall, at a minimum, invite representatives from the Water Board, BCDC, Conservancy, Corps, USFWS, and the NMFS. The purpose of this committee shall be to assess progress of the Project's ecosystem restoration by reviewing monitoring data, and to suggest adaptive management strategies. Results of the data analysis shall be presented to the TAC at least biennially, for discussion and comment.

21. **California EcoAtlas**. The Discharger shall use the standard California Wetlands Form to provide Project information describing impacts and restoration measures not later than 14 days from the date of completion of Project construction activities. An electronic copy of the form can be downloaded from: http://www.waterboards.ca.gov/sanfranciscobay/certs.shtml. The completed form shall be submitted electronically to habitatdata@waterboards.ca.gov or shall be submitted as a hard copy to both (1) the Water Board, to the attention of EcoAtlas, and (2) the San Francisco Estuary Institute, 4911 Central Avenue, Richmond, CA 94804, to the attention of EcoAtlas.

Project: Future Phase I activities and Phases II and III

22. **Photo-Documentation Report**. To document levee and Pond conditions immediately at the Project site, the Discharger shall establish a minimum of 20 photo-documentation points at each Project component, including all Phase I construction events, Phase II, and Phase III. These photo-documentation points should be selected to depict the pre- and immediate post-Project conditions where impacts to waters of the U.S. occur, including the FRM levee, Ponds A9 to A15, ecotone areas, stockpiling areas, and the adjacent areas. The Discharger shall prepare site maps with the photo-documentation points clearly marked. Prior to implementing each phase, the Discharger shall photographically document the condition of each site. These photo-documentation points shall be clearly marked and identified on a map that shall be included in the as-built reports.

23. **As-Built Plans**. The Discharger shall prepare an as-built report acceptable to the Water Board's Executive Officer. The as-built report shall be submitted to the Water Board's Executive Officer not later than 180 days after each Project phase, or construction event, is completed. The report shall describe the areas of actual disturbance during Project construction. The report shall clearly identify and illustrate the Project site and the locations of permanent and temporary impacts. Any deviations from the submitted 100 percent design plans, including impact quantities, shall be depicted in the as-built report. These deviations shall be displayed with reference to the 100 percent design drawings, and any installed structures or alterations to waters of the State shall be shown as the actual elevations in the as-built report. If the as-built report indicates that impacts were greater than those authorized in this Order, the Water Board's Executive Officer may require enforcement and additional action by the Discharger, including but not limited to compensatory mitigation. The as-built report shall be submitted in both digital format and hard copy of at least 11-inches by 17-inches to the Water Board. The as-built report shall be submitted either by electronic mail to staff or by uploading it to the Water Board's FTP internet site. Instructions for uploading documents to the FTP internet site are available at http://www.waterboards.ca.gov/sanfranciscobay/publications_forms/documents/FTP_Discharger_Guide-12-2010.pdf. If the as-built report is submitted by uploading it to the FTP internet site, the Discharger shall notify the Water Board case manager via electronic mail. For purposes of this Order, the definition for construction completion shall be the final date when construction contractors (excluding contractors for revegetation activities) are in the Project site.

24. **Notice of Mitigation Completion**. When the Discharger has determined that a mitigation area achieved the performance standards and final success criteria specified in the MAMP, a notice of mitigation completion shall be submitted to the Water Board's Executive Officer. After acceptance of the notice of mitigation completion in writing by the Water Board's Executive Officer, the Discharger's submittal of mitigation monitoring reports for that mitigation component is no longer required.

25. **Project Completion Report**. The Discharger shall notify the Water Board by electronic mail or by hard copy of Project completion upon transfer of the Project, including the FRM levee and ecosystem restoration components, to the Non-Federal Sponsors. This notification, known as a Project Completion Report, shall consist of the following information: (a) the CIWQS Place ID for this Project (i.e., CWIQS Place ID 813084); (b) the date Project construction activities were completed; and (c) the completion date of mitigation plantings. Project construction activities for the purpose of this condition are defined as activities associated with construction of the Project, establishing native grass vegetation on the banks, and any plug plantings as per the Planting Plan. The Project Completion Report shall be submitted to Tahsa Sturgis at tahsa.sturgis@waterboards.ca.gov, Christina Toms at christina.toms@waterboards.ca.gov, and Brian Wines at brian.wines@waterboards.ca.gov or the current Water Board staff member assigned to the Project.

Reach 1

26. **Reach 1 100 Percent Design**. The Discharger shall prepare 100 percent design plans for Phase I, Reach 1 acceptable to the Water Board's Executive Officer. The 100 percent design plans for Phase I, Reach 1 shall be submitted to the Water Board's Executive Officer for review and acceptance not later than 90 days prior to construction of Phase I, Reach 1. The plans shall describe the areas of anticipated disturbance during Project construction. The plans shall clearly identify and illustrate the Project site and the locations of permanent and temporary impacts. Any deviations from the submitted 90 percent design plans, including impact quantities, shall be depicted.

27. **Reach 1 Completion Report**. The Discharger shall notify the Water Board by electronic mail or by hard copy when construction of Reach I is completed. This notification, known as the Reach I Completion Report, shall consist of the following information: (a) the CIWQS Place ID for this Project (i.e., CWIQS Place ID 813084); and (b) the date Project construction activities were completed. Project construction activities for the purpose of this provision are defined as activities associated with construction of Reach I. The Reach I Completion Report shall be submitted to Tahsa Sturgis at tahsa.sturgis@waterboards.ca.gov, Christina Toms at christina.toms@waterboards.ca.gov, and Brian Wines at brian.wines@waterboards.ca.gov or the current Water Board staff member assigned to the Project.

28. **Final Operations and Maintenance Manual**. The Discharger shall prepare a workplan for the Project's Operation, Maintenance, Repair, Replacement, and Rehabilitation (O&M) Plan acceptable to the Water Board's Executive Officer. The workplan shall be submitted to the Water Board's Executive Officer for review and acceptance prior to the beginning of development of the O&M Plan. The workplan shall include collaborative review of a draft O&M Plan by a workgroup including the TAC members listed above. The Discharger shall

submit the final O&M Plan to the Water Board's Executive Officer for review and acceptance upon transfer of the Project to the local non-federal sponsor.

Deliverables for Future Project Phases

29. **Annual Status Updates**. The Discharger shall prepare and submit a status update report to the Water Board's Executive Officer not later than January 31 of each year until the Project is completed. Once monitoring activities begin, the status update report shall be submitted with the annual reports (see Provision 14). Each report shall describe the Project's progress, the status of each Project component, the status or anticipated change to Project funding for each component, and all other information, as appropriate.
30. **Project component 30 Percent Designs**. The Discharger shall prepare 30 percent design plans for subsequent Project work, including future Phase I construction activities, acceptable to the Water Board's Executive Officer. The 30 percent design plans shall be submitted to the Water Board's Executive Officer for review and acceptance not later than 12 months prior to the anticipated construction initiation date.

31. **Project component 60 Percent Designs**. The Discharger shall prepare 60 percent design plans for subsequent Project work, including future Phase I construction activities, acceptable to the Water Board's Executive Officer. The 60 percent design plans shall be submitted to the Water Board's Executive Officer for review and acceptance not later than 8 months prior to the anticipated construction initiation date. At a minimum, the 60 percent design plans shall include all components that were deemed acceptable in the Phase I, Reach I 60 percent design submittal.

32. **Project component 90 Percent Designs**. The Discharger shall prepare 90 percent design plans for subsequent Project work, including future Phase I construction activities, acceptable to the Water Board's Executive Officer. The 90 percent design plans shall be submitted to the Water Board's Executive Officer for review and acceptance not later than 6 months prior to the anticipated construction initiation date. The plans shall describe the areas of anticipated disturbance during Project construction. The plans shall clearly identify and illustrate the Project site and the locations of permanent and temporary impacts.

33. **Project component 100 Percent Design**. The Discharger shall prepare 100 percent design plans for subsequent Project work, including future Phase I construction activities, acceptable to the Water Board's Executive Officer. The 100 percent design plans shall be submitted to the Water Board's Executive Officer for review and acceptance not later than December 15 in the year prior to the anticipated construction initiation date. The plans shall describe the areas of anticipated disturbance during Project construction. The plans shall clearly identify and illustrate the Project site and the locations of permanent and temporary impacts.

34. **Mechanism for approval of subsequent Project work.** The Discharger shall prepare supplemental applications for subsequent Project work, including the remaining Phase I construction events, Phase II, and Phase III, acceptable to the Water Board's Executive Officer. The supplemental applications shall be submitted to the Water Board's Executive Officer for review and acceptance not later than 12 months prior to the anticipated construction initiation date. The supplemental application shall consist of the following:

    - A complete CWA section 401 Water Quality Certification Application and Report of Waste Discharge (ROWD).
    - A revised CMMP that reflects the current net loss of waters of the U.S. and corresponding compensatory mitigation options.
    - Engineering design plans (see Provisions 30 to 32).
    - A supplemental analysis that demonstrates the impacts have been reduced to the maximum extent practicable, and ecosystem restoration has been optimized (see Provision 35).
    - Prior to Phase I's second construction event, an EPMP shall be submitted, along with the supplemental application, to the Water Board's Executive Officer for review and acceptance. The EPMP document shall contain information that details how the Project's compensatory mitigation (i.e., ecosystem restoration) for fill impacts to waters of the U.S. will be monitored, including monitoring targets, metrics, and methods, to ensure there is not a loss in existing functions, values, or habitat. The supplemental document may contain and reference the MAMP, but shall also provide additional information, including monitoring activities for mitigation identified in this Order for the Project's fill impacts (see Findings 20 to 22) and an ecotone module. This additional information regarding monitoring is consistent with the anticipated development specified in the MAMP Sections 3.1 and 3.3. The following are the minimum requirements for additional information that shall be included in the supplemental document:

        i. A complete pond and ecotone module that provides detailed methods, protocols, timing, performance and final success criteria, and Non-Federal Sponsors' roles for all pond and ecotone monitoring activities, including baseline monitoring, that will be implemented after each pond breach occurs. Since the pond monitoring in Phases II and III will reflect lessons learned from monitoring previously breached ponds, the pond and ecotone module shall undergo future revisions. All future revisions to the monitoring plan shall be submitted to the Water Board's Executive Officer for review and acceptance by January 31 in the year that pond breaches or adaptive management actions are proposed.

ii. Clearly defined monitoring roles and responsibilities for the Non-Federal Sponsors, including updated monitoring cost estimates and contributions by the Non-Federal Sponsors during each pond's monitoring period.

iii. Consistent with Section 3.1 and 3.3 of the MAMP, a summary of the updated MAMP methods, triggers, and actions. The summary shall provide a technical justification for each trigger and action. The summary shall be updated as needed prior to each future pond-breaching event. Updated summaries shall be submitted to the Water Board's Executive Officer by January 31 in the year that pond breaches or adaptive management actions are proposed. Updated MAMP methods, triggers, and actions shall address:

- The timing and duration of pressure transducer deployment to monitor water levels in the ponds
- The locations of transects or Surface Elevation Tables to monitor sedimentation rates in ponds
- Methods for monitoring suspended sediment concentrations within tidal source waters and restoring ponds
- Additional detail re: the timing of aerial photography flights, and the types of products that will be collected (e.g. natural color, infrared, normalized vegetation difference index, etc.)
- Methods for assessing the acreage and geographic distribution of high tide refugia within and along the ponds
- Methods, triggers, and actions for addressing the percent cover and species richness of native plants on FRM levee side slopes, ecotone side slopes, restored marsh areas, and lowered pond levees, as well as for minimizing the establishment and spread of invasive species[12] throughout the site. Please note that the Water Board typically requires corrective action when invasive species make up 20% of the relative cover or 5% of the absolute cover in a given area.

iv. The Water Board is a lead agency in the development and implementation of a San Francisco Bay Regional Wetland Monitoring Program (Wetlands RMP), a proposed coordinated and comprehensive long-term monitoring program with the goal of monitoring Bayland wetlands to ensure their on-going management, restoration and protection. Development and implementation of a San Francisco Bay Regional Wetland Monitoring Plan is also called for the in the CCMP, also called the Estuary

[12] Invasive species include those listed by the California Invasive Plant Council at http://www.cal-ipc.org/ip/inventory/

Blueprint. It is expected that the Discharger may choose to comply with any requirement of this Provision through a collaborative effort (i.e., Wetlands RMP) to conduct or cause to be conducted the required monitoring.

v. A mechanism to verify that the sea level rise is occurring at the rate assumed in the Application materials.

- Appropriate CEQA documentation for any impacts not previously considered in the Joint EIS/EIR.

35. **Impact Reduction and Environmental Benefit Optimization**. The Discharger shall prepare supplemental analysis for subsequent Project work acceptable to the Water Board's Executive Officer. The supplemental analysis shall be submitted to the Water Board's Executive Officer not later than 12 months prior to the anticipated initiation date for that activity. When the Water Board reviews project alternatives to determine the least environmentally damaging practicable alternative (LEDPA), all State water quality standards must be met. Supplemental analysis shall demonstrate impacts to waters of the U.S. have been reduced to the maximum extent practicable and the Project's environmental benefit has been optimized. The supplemental analysis shall be submitted to the Water Board's Executive Officer for review and approval with the corresponding supplemental application (see Finding 34). If the Board's Executive Officer finds that the supplemental analysis may cause a significant alteration to the Project, as defined in Finding 15, then the supplemental analysis may be presented before the Water Board for review and approval prior to implementation. Each supplemental analysis shall contain relevant technical documents that demonstrate each phase results in the optimized alignment that reduces impacts and increases restoration acreage.

The following are technical documents that shall be included in the supplemental analysis, as appropriate:

- Comparison of how alternate FRM levee alignments along Reaches 4 and 5, east of Artesian Slough, including the alignment proposed by the Water Board (see Att. C), would affect long-term water management, water quality, and habitat functions/values of the City and landfill mitigation marshes, given projected sea level rise and the need for these marshes to continue to provide suitable habitat for state and federally listed tidal wetland species (Att. C, Figures 1 and 3);

- Comparison of projected short-term (0 to 10 years post-breach) and long-term (10+ years post-breach) establishment of vegetated tidal marsh plain seaward of the FRM levee under alternate levee alignments east of Artesian Slough and suspended sediment concentrations of 100 mg/L and 200 mg/L (consistent with the modeling work performed by ESA PWA in 2012 and cited in the September 2015 South Bay Shoreline Phase 1 Study);

- Profiles for Artesian Slough and Coyote Creek Option
- Cross-Sections Representing Existing and Future Conditions by Reach
- Soil suitability reports for the landward levee alignment east of Artesian Slough;
- Demonstration of land acquisition for alternative levee alignments; and
- Demonstration that the Artesian Slough crossing design will not affect mixing rates and dilution for the RWF's discharges.

36. **Public Notice**. The Water Board will public notice supplemental applications. If public commenters request a public hearing, or if there are other issues meriting a hearing before the Water Board, the Board will consider approval of the supplemental application at its regular meeting. In the absence of a request or other issues, the Executive Officer may approve the supplemental application administratively.

Other Requirements

37. The Discharger shall immediately notify the Water Board by telephone whenever an adverse condition occurs as a result of this discharge. Such a condition includes, but is not limited to, a violation of the provisions of this Order, a significant spill of petroleum products or toxic chemicals, or damage to control facilities that would cause noncompliance. A written notification of the adverse condition shall be submitted to the Water Board within two weeks of occurrence. The written notification shall identify the adverse condition, describe the actions necessary to remedy the condition, and specify a timetable, subject to the modifications of the Executive Officer, for the remedial actions.

38. The Discharger shall notify the Water Board, in writing or via electronic mail, at least 30 days prior to actual start dates for each Project component (i.e., prior to the start of grading or other construction activity for any Project component, including the compensatory mitigation components).

39. The Discharger shall at all times fully comply with the prohibitions, specifications, mitigation and monitoring requirements, engineering plans, specifications, and technical reports submitted with the Application and the plans and reports required by this Order (e.g., Provisions 7 to 11, 14 to 16, 19, 21 to 35)17, which, together, serve as the basis for the Project description this Order covers.

40. The Discharger shall be responsible for work conducted by its consultants, contractors, and subcontractors on the Project.

41. The Discharger is considered to have full responsibility for correcting any and all problems that arise in the event of a failure that results in an unauthorized release of waste or wastewater. The discharge of any hazardous, designated, or non-hazardous waste as defined in Title 23, Division 3, Chapter 15 of the California Administrative Code, shall be disposed of in accordance with applicable State and federal regulations.

42. The Discharger shall remove and relocate any wastes that are discharged at any sites in violation of this Order.

43. The Discharger shall maintain a copy of this Order at the Project site at all times during construction of the Project and be made available to Water Board staff upon request. All foremen and other employees responsible for overseeing that construction of the Project complies with permitting requirements shall have access to and be familiar with the Order requirements.

44. The Discharger shall permit the Water Board or its authorized representatives at all times, upon presentation of credentials:

    a. Entry onto Project premises, including all areas on which fill of wetlands or other waters will occur or on which fill is located or mitigation is occurring or in which records are kept.

    b. Access to copy any records required to be kept under the terms and provisions of this Order.

    c. Inspection of any treatment equipment, monitoring equipment, or monitoring method required by this Order.

    d. Sampling of any discharge or surface water covered by this Order.

45. This Order does not authorize commission of any act causing injury to the property of another or of the public; does not convey any property rights; does not remove liability under federal, State, or local laws, regulations or rules of other programs and agencies, nor does this Order authorize the discharge of wastes without appropriate permits from other agencies or organizations.

46. The Discharger shall timely pay all fees associated with this Order. The fee amount for this Order shall be in accordance with the current fee schedule, per California Code of Regulations, Division 3, Chapter 9, Article 1, section 2200(a)(3). The fee payment shall indicate the Order number, the CIWQS Place ID no. 813084, the Regulatory Measure ID no. 413855, and the applicable season.

47. This Order is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to CWC section 13330 and 23 CCR section 3867.

48. The Water Board may add to or modify the conditions of this Order, as appropriate, to implement any new or revised water quality standards and implementation plans adopted and approved pursuant to the CWC or CWA section 303 or in response to new information concerning the conditions of the Project. Additionally, the Water Board reserves the right to suspend, cancel, or modify and reissue this Order, after providing notice to the Discharger, if the Water Board determines that the Project fails to comply with any of the conditions of this Certification, or when necessary to implement any new or revised water quality standards and implementation plans adopted or approved pursuant to the CWC or CWA section 303 (33 U.S.C. § 1313).

49. This Order is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent Project materials for the Order were filed pursuant to 23 CCR subsection 3855(b) and those Project materials specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

50. The Water Board may consider rescission of this Order upon Project completion and the Executive Officer's acceptance of notices of completion of mitigation for all mitigation, creation, and enhancement projects required or otherwise permitted now or subsequently under this Order.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, complete and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on December 13, 2017.

_____
Bruce H. Wolfe
Executive Officer

Attachments

Attachment A: Project Figures
Attachment B: Monitoring and Adaptive Management Plan (MAMP)
Attachment C: Landward Levee Alignment East of Artesian Slough Memo
Attachment D: Phase I, Reach I 60 Percent Design Plans